Vol. 886 Number 1

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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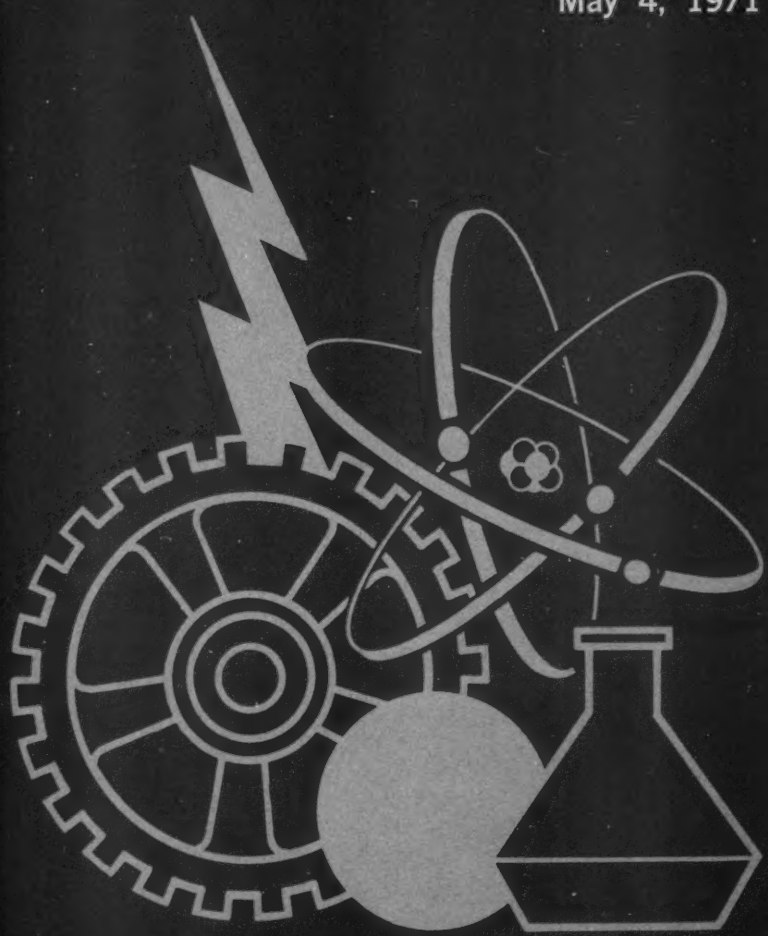
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

May 4, 1971



U. S. DEPARTMENT OF COMMERCE

Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

May 4, 1971 Volume 886 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

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Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.O.

PATENT OFFICE NOTICES

Certificates of Correction for the Week of May 4, 1971

Re. 26,749	3,531,885	3,544,966	3,551,425
Re. 27,016	3,532,756	3,545,520	3,551,835
D. 219,319	3,532,972	3,546,018	3,551,848
3,333,484	3,533,286	3,546,184	3,552,468
3,375,187	3,533,959	3,546,736	3,552,910
3,417,084	3,534,265	3,546,913	3,553,126
3,443,219	3,535,936	3,547,534	3,553,546
3,472,038	3,535,965	3,547,815	3,553,671
3,472,225	3,537,834	3,548,348	3,554,794
3,476,605	3,539,123	3,548,382	3,554,989
3,477,432	3,539,465	3,548,780	3,555,020
3,496,241	3,539,739	3,548,823	3,555,078
3,496,243	3,539,776	3,549,534	3,555,530
3,499,382	3,541,040	3,549,546	3,556,305
3,505,287	3,541,887	3,549,638	3,557,012
3,510,516	3,541,906	3,549,851	3,557,111
3,510,635	3,542,117	3,550,583	3,557,611
3,512,484	3,542,756	3,551,087	3,558,291
3,516,375	3,543,943	3,551,186	3,558,563
3,520,398	3,544,439	3,551,263	3,558,572
3,521,543	3,544,495	3,551,380	3,559,654
3,527,704	3,544,530	3,551,407	3,560,209
3,531,326	3,544,690	3,551,409	3,560,309

Service by Publication

Elmer J. Knize

In accordance with Rule 47 of the Rules of Practice of the United States Patent Office in Patent Cases, Notice is hereby given of the filing on June 16, 1969, of an application for patent entitled "Dispenser With Cup Supporting Bristles," on behalf of Elmer J. Knize, whose last known address is 4049 West 31st Street, Chicago, Illinois. The application was made in compliance with Rule 47(a) and 35 U.S.C. 116 by Howard W. Johnson and Giacinto C. D'Ercoli without execution by the said Elmer J. Knize.

Any action to be taken by the said Elmer J. Knize in connection with the said application must be taken within thirty days of the publication of this notice.

RICHARD A. WAHL,
Assistant Commissioner of Patents.

Patents Available for Licensing or Sale

3,191,513. FOLDING BELLOWS WITH INTERLOCKING CORNERS FOR PHOTOGRAPHIC DEVICES. Correspondence to: Central Trust Company Rochester N.Y., 44 Exchange St., Rochester, N.Y., 14614. Attn.: William K. Sjea, asst. vice pres.

3,389,561. METHOD OF AND APPARATUS FOR PROVIDING ANCHORS IN EARTH AND/OR ROCK FORMATIONS. Kenneth R. Taylor, P.O. Box 2185, Renton, Wash., 98055.

3,462,008. STORAGE AND HANDLING OF CHEMICAL SUBSTANCES. FEB, Limited, Manchester, England. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,519,250. STORAGE AND HANDLING OF CHEMICAL SUBSTANCES. FEB, Ltd., Manchester, England. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,535,667. ELECTRICAL SAFETY DEVICE. Henry C. Harnish, Jr., and Anthony J. Osello, Elcock Ave., Boonton, N.J. 07005.

3,549,035. FORK ASSIST. Donald W. Soper, Cross St., Orland, Maine, 04472.

3,552,388. BABY PATTING MACHINE. Thomas N. Zelenka, 205 S. Lemoore Ave., Lemoore, Calif., 93245.

3,557,999. PUSH-BUTTON SELF-OPENER CAN. Pedro Chagoyen, 81—07 25th Ave., Jackson Heights, N.Y., 11370.

3,559,305. GRADE AVERAGING DEVICE. Clyde S. Mundell, R.D. 1, Box 107, Carmichaels, Pa.

3,559,565. BARBEQUE GRILL. Clarence A. Getz, P.O. 316, Davenport, Wash., 99122.

3,559,339. COLLAPSIBLE PLANT STAKE ASSEMBLY. Robert W. Worley, 426 S. Clifton, Wichita, Kans., 67218.

3,560,015. COMBINED WHEEL AND PACK CARRIER. Lee J. Tracy, 629 8th St., Ogden, Utah, 84404.

3,560,047. FOLDABLE PORTABLE CHAIR WITH LIQUID DISPENSER. John Davis, 1200 La Cruz, El Paso, Tex., 79902.

3,563,159. ROTISSERIE. Martha Johnson, Huntington, W. Va. Correspondence to: Sherman Levy, Suite 602, Victor Bldg., 724 9th St. NW., Washington, D.C., 20001.

3,564,309. DATA STORAGE AND QUICK RETRIEVAL UNIT. Correspondence to: Sherman Levy, Suite 602 Victor Bldg., 724 9th St. NW., Washington, D.C., 20001.

The following 3 patents are offered by: John W. Barnd, 32 Gollybrook Road, Paramus, N.J.

3,351,128. MULTI-ZONE TEMPERATURE CONTROL.

3,496,991. FLUID TEMPERATURE REGULATING METHOD AND APPARATUS.

3,515,345. MULTI-ZONE TEMPERATURE CONTROL.

The following 4 patents are offered by: Joseph A. Vriend, P.O. Box 505, Squamish, British Columbia, Canada.

3,205,487. PORTABLE VISUAL SIGNAL DEVICE FOR GIVING VISUAL MORSE CODE SIGNALS.

3,361,487. PULSATING BRAKE.

3,415,334. HYDRAULIC DRIVE FOR MOTOR VEHICLES.

3,574,293. ANTI-KNOCK BEARING DEVICE.

General Electric Company is prepared to grant non-exclusive licenses under the following 10 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Patent Counsel, General Electric Company, Bldg. 1, Electronics Park, Syracuse, N.Y., 13201.

3,122,610. CIRCUITRY FOR MULTIPLEX TRANSMISSION OF FM STEREO SIGNALS WITH PILOT SIGNAL.

Applications for license under the following patent may be addressed to: Patent Counsel, Telecommunication Products Dept., General Electric Company, Lynchburg, Va., 24502.

3,197,167. MOUNTING CLIP FOR POT CORE.

Applications for license under the following 2 patents may be addressed to: Division Patent Counsel, Power Transmission Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,546,407. VACUUM-TYPE CIRCUIT INTERRUPTER.

3,555,354. ALTERNATING CURRENT CIRCUIT BREAKER HAVING A CONTROL FOR TIMING OPENING RELATIVE TO THE CURRENT WAVE.

Applications for license under the following 3 patents may be addressed to the Patent Counsel, Communication and Control Device Products Dept. General Electric Co., Waynesboro, Va., 22980.

3,346,874. POWER CONTROL CIRCUITS.

3,553,612. MINIATURE RELAY WITH DOUBLE AIR GAP MAGNETIC CIRCUIT.

3,554,338. TWO-DIRECTIONAL ROTATION CLUTCH ASSEMBLY.

Applications for license under the following 3 patents may be addressed to the Division Patent Counsel, General Electric Co., Space Division, P.O. Box 8555, Philadelphia, Pa., 19101.

3,549,436. LAYERED PROPELLANT COMPOSITION CONSISTING OF AN ELECTRICAL CONDUCTOR AND AN INSULATOR.

3,551,111. REACTION-EXTRACTION AND ANALYSIS CHAMBER AND RELATED EQUIPMENT.

3,554,669. ELECTRICFLUID ENERGY CONVERTER.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 20, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-01-69
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-22-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-04-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-26-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-03-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	8-17-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-01-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-02-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-03-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-05-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-03-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	1-23-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	12-10-69
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	5-07-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during May 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,677,129 to 2,679,644, inclusive
Plant Patents ..... Numbers 1,274 to 1,281, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MAY 4, 1971

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

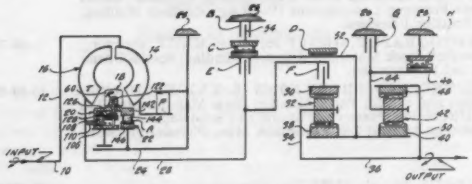
Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T886,001
HYDROKINETIC POWER TRANSMISSION SYSTEM WITH A SUBSTANTIALLY IDEAL FUNCTIONAL RELATIONSHIP BETWEEN OUTPUT SPEED AND TRACTIVE EFFORT

Martin G. Gabriel, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of application Ser. No. 518,853, Jan. 5, 1966. This application May 20, 1968, Ser. No. 738,368

Int. Cl. F16h *47/00*
U.S. Cl. 74—732
4 Sheets Drawing. 13 Pages Specification



This specification describes a hydrokinetic torque converter transmission having an increased low speed torque-ratio in geared portions of the mechanism and having a bladed stator of variable geometry in the torque convertor portion of the mechanism. The individual stator blades are mounted on rotatable stator blade shafts which can be rotated to effect angular adjustment of the stator blades by means of a rack-and-pinion servo. An increased degree of deflection of the toroidal fluid flow in the stator region of the circuit is obtained as the converter speed ratio increases thereby providing an overall torque ratio characteristic that approaches a theoretical, ideal performance.

T886,002
PREPARATION OF ORIENTED FOAM LAMINAR STRUCTURES

Leon Edward Wolinski, Buffalo, N.Y., and Roland G. Harris, Chadds Ford, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 848,206, Aug. 7, 1969. This application Sept. 26, 1969, Ser. No. 861,467

Int. Cl. C09j *5/00*
U.S. Cl. 156—311
No Drawing. 8 Pages Specification

Process for the preparation of film-foam laminar structures substantially free from warp which comprises maintaining the laminar structure in a flat configuration after lamination while cooling the structure below the distortion temperature of the foam. In a preferred embodiment the foam sheet is an oriented closed cell foam consisting essentially of styrene polymer. The preferred films are of polyvinyl chloride and polypropylene.

T886,003
GAUGE CONTROL OF FOAM STRUCTURES

Leon Edward Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1969, Ser. No. 861,477
Int. Cl. B29d *27/00*; B32b *5/18*; C08f *7/04*
U.S. Cl. 264—51
No Drawing. 12 Pages Specification

Process for the treatment of thermoplastic closed cell foam structures by:

(a) Heating the structure to at least the second order transition temperature of the foam and below the temperature at which the foam undergoes cellular collapse,

(b) Compressing the foam structure to a thickness less than the nominal thickness of the foam structure and greater than the thickness determined according to the formula:

$$T=AB/C$$

wherein T is the desired minimum thickness, A is the density of the foam prior to treatment, B is initial nominal thickness of the foam, and C is the density of the unfoamed polymer, and

(c) Expanding the foam structure substantially free from restraint until the temperature of the foam structure is below the second order transition temperature.

T886,004
PURIFICATION OF DIPOTASSIUM TEREPHTHALATE

Erdem M. Atadan, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 4, 1969, Ser. No. 882,281
Int. Cl. C07c *51/42*
U.S. Cl. 260—525
No Drawing. 7 Pages Specification

Purified dipotassium terephthalate is recovered from crude aqueous dipotassium terephthalate solution containing potassium para-toluate as an impurity by crystallizing dipotassium terephthalate in an amount such that the weight ratio of potassium para-toluate to dipotassium terephthalate remaining in the aqueous solution does not exceed the potassium para-toluate to dipotassium terephthalate weight ratio at which potassium para-toluate will begin to crystallize, followed by separating the dipotassium terephthalate crystals from the aqueous solution, preferably by filtration. The crude aqueous solution of dipotassium terephthalate can be prepared either by dissolving crude terephthtalic acid in a potassium alkaline aqueous solution, e.g., aqueous potassium hydroxide, or directly from the oxidation of para-xylene or para-toluic acid in a potassium alkaline aqueous medium. The crystallization is conducted at about from 0° to 160° C., preferably about from 10 to 140° C.. and at about from 0.1 to 10, preferably about from 0.5 to 4, atmospheres of total pressure. The dipotassium terephthalate can then be washed with any solvent which is chemically inert with respect to the dipotassium terephthalate, preferably a nearly saturated aqueous solution of dipotassium

terephthalate, to displace any remaining mother liquor. Purified terephthalic acid can then be recovered by acidifying an aqueous solution of the purified dipotassium terephthalate.

T886,005
PRINTING INKS
Leon Edward Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 17, 1969, Ser. No. 886,032
Int. Cl. C08h *9/00;* **C09d** *3/26, 11/06*
U.S. Cl. 106—27
No Drawing. 6 Pages Specification

A fast-drying printing ink useful in commercial lithographic printing and particularly useful in printing folded cartons and the like.

The ink comprises:

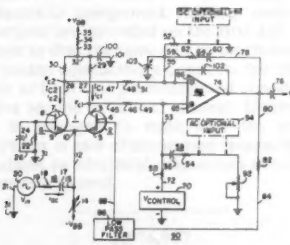
(A) a pigment;

(B) about 5–33 percent of an organic acid having from 8–20 carbon atoms and at least one set of conjugated double bonds such as an α or β form of oleostearic acid or a mixture of organic acids such as China oil;

(C) about 1.5–20 percent of a drying composition such as a solution of cobalt salts of aliphatic acids having from 4–40 carbon atoms, preferably C_8–C_{10} for an optimum balance of properties and particularly preferred is a 12 percent solution of a cobalt salt complex of a branched C_{10} aliphatic acid; and

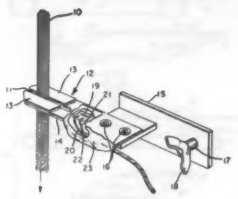
(D) up to about 30 percent plasticizer such as an ether phthalate selected from bis(2-ethoxyethyl) phthalate, bis(2-methoxyethyl) phthalate, butyl benzyl phthalate.

T886,006
LINEAR FOUR-QUADRANT MULTIPLIER
Daniel R. Nichols, 302 John Ave., Linthicum Heights, Md. 21090
Filed Apr. 15, 1970, Ser. No. 28,679
Int. Cl. G06g *7/12*
U.S. Cl. 307—229
2 Sheets Drawing. 16 Pages Specification



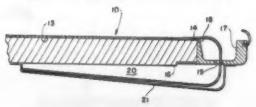
A circuit for multiplying two voltages together. The output is a voltage which is proportional to the product of the two voltages and whose sign is directly related to the signs of each of the input voltages. Even though nonlinear elements are used, such as transistors, the final output voltage varies linearly with each of the input voltages. An AC voltage (2) is an input to a high gain amplifier (1). A DC voltage (70) is an input to a high gain operational amplifier (68). The two amplifiers are interconnected by a DC bridge and an AC bridge. Initially, both bridges are balanced. A change in the DC voltage momentarily unbalances the output of the DC bridge. The high gain of the operational amplifier (68) provides a degenerative feedback voltage to control the multiplying amplifier (1) by rebalancing the DC bridge so that the overall output is a linear multiplication.

T886,007
APPARATUS FOR DETECTING OVERSIZE DEFECTS IN YARN
John Vipond Harvey, 36 Campbell Crescent; Bruce Alexander Robinson, 3 Holland Crescent; and John William Stassen, 155 Division St., all of Kingston, Ontario, Canada
Filed May 4, 1970, Ser. No. 34,167
Int. Cl. G01n *19/08*
U.S. Cl. 73—160
2 Sheets Drawing. 6 Pages Specification



A device for detecting oversize defects in yarns or filaments comprising a slotted flexible guide **12** having a strain gauge **19** mounted thereon. The yarns or filaments **10** are passed through the slot **11** and a defect in the yarns or filaments causes the guide to deflect a distance according to the size of the defect. The deflection produces a signal from the strain gauge which is fed to a discriminator that compares the magnitude of the signal with a preset level and eliminates signals from small defects. The device is particularly adaptable in solvent spinning of synthetic fibers for detecting oversize filaments, and polymer drips.

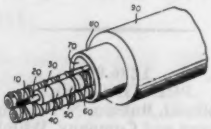
T886,008
DRAWING BOARD
James E. McConkey, 901 Elmgrove Road, Rochester, N.Y. 14624
Filed June 8, 1970, Ser. No. 44,462
Int. Cl. A47b *27/00, 63/04*
U.S. Cl. 312—23
1 Sheet Drawing. 6 Pages Specification



A drawing board is provided with a workface, an underface and a tray for holding drawing utensils or the like. The tray is arranged with respect to the workface so that a sheet of drawing paper supported on such workface, when overlapping an edge of the drawing board, will be partially disposed in such tray. A slot in the tray is of dimensions suitable for passage therethrough of the supported drawing sheet and communicates with a chamber located on the underface of the drawing board. Accordingly, a draftsman may remain seated at the drawing board and work on all areas of the supported sheet by feeding such sheet through the tray slot and into and out of the chamber.

T886,009
TRANSMISSION CABLES
David E. Hoiness, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed July 15, 1970, Ser. No. 55,030
Int. Cl. H01b 9/06
U.S. Cl. 174—25
1 Sheet Drawing. 10 Pages Specification

A cable for the high voltage transmission of electrical power which is composed of a conductive wire wrapped with several layers of insulative and shielding materials. One such insulative material in an oil impregnated paper in which the oil is a cable oil and the paper is composed of a mixture of aromatic polyamide fibrids and fibers (e.g., fibrids and fibers of a wholly aromatic polyamide such as poly(meta-phenylene isophthalamide). The cables



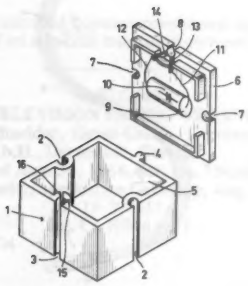
have low electrical loss properties due to the low dissipation loss factor and the good dielectric strength of the above-identified paper.

PATENTS

GRANTED MAY 4, 1971

ELECTRICAL

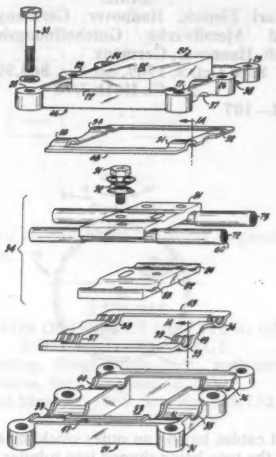
3,576,936
ASSEMBLY KIT
Artur Fischer, Grunmetterstr 133, Tumlingen, Germany
Filed Jan. 16, 1969, Ser. No. 791,748
Claims priority, application Germany, Jan. 24, 1968, P16 78 334.9
Int. Cl. G09b *23/18*
U.S. Cl. 35—19A **7 Claims**



An assembly kit has first structural elements and second structural elements the latter of which each are provided with an electrical component. Mating male and female coupling portions are provided on the first and second structural elements so that the same can be mechanically coupled. Conductor means conductively connects the electrical components with at least one predetermined coupling portion of the respective second structural element. Electrical connecting means is arranged to mate with the predetermined coupling portions of two of the second structural elements to thereby establish an electrical connection between the electrical components thereof.

3,576,937
UNDERGROUND RIGID CONNECTOR HOUSING SEAL
Raymond W. Eldridge, Jr., St. Louis, Mo., assignor to International Telephone & Telegraph Corporation, New York, N.Y.
Filed Dec. 26, 1968, Ser. No. 787,098
Int. Cl. H02g *15/08*
U.S. Cl. 174—92 **4 Claims**

An underground connector housing for large diameter power lines is enclosed within a split housing comprised of upper and lower Fiberglas reinforced plastic shells. These shells have entrance and exit ports for receiving the power cables which are connected together inside the housing. Gaskets seal the housing by following the contours of the mating surfaces on each shell of the Fiberglas housing. At the ports, the gaskets are increased slightly in thickness. Hence, the compression forces which occur when the two parts are bolted together, squeeze the gaskets together to force them

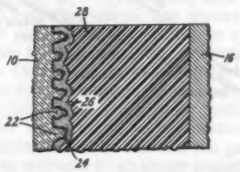


to expand and fill all of the available space within the housing parts and around the cables.

ERRATUM

For Class 174—128 see:
Patent No. 3,577,151

3,576,938
ELECTRICAL INSULATOR WITH POLYMER-CONTAINING JOINT BETWEEN THE PORCELAIN AND THE HARDWARE
Frank A. Capotosto, Newtown Square, Pa., and Robert V. Klint, Woodstown, N.J., assignors to General Electric Company
Filed Nov. 7, 1969, Ser. No. 874,853
Int. Cl. H01b *17/14, 17/38*
U.S. Cl. 174—196 **6 Claims**



Discloses an electrical insulator that comprises an improved joint for attaching the insulator hardware to the porcelain body of the insulator. The porcelain has a roughened surface, and the joint comprises a thin release coating of

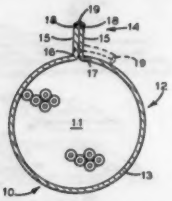
solid polymeric material on the roughened surface, a thicker coating of a polymer filled with a dry lubricant overlying the release coating but unbonded thereto, and a filled polymer in the space between the hardware and thicker coating that is bonded to both the thicker coating and the hardware. The release coating prevents the thicker coating from adhering to the roughened surface of the porcelain but is so thin that the thicker coating is still able to mechanically interlock with the roughened surface.

3,576,939

ELECTRICAL CABLES AND METHOD OF MAKING SAME

Gerhard Karl Ziemek, Hannover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Oct. 9, 1969, Ser. No. 864,984
Int. Cl. H01b 7/18
U.S. Cl. 174—107 **10 Claims**



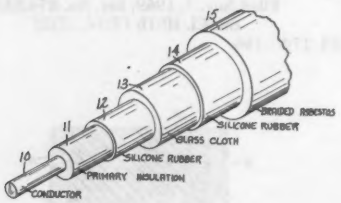
Electrical cables having an outer shielding element of thin metal tape; the tape being shaped into tubular form about the cable core and having a longitudinal seam; the seam having marginal tab portions integral with the tape and in face-to-face contact, the outer edges of the tab portions being metallically integrated to provide electrical conductivity continuously about the circumference thereof and to form a fluid-impervious envelope for the core which is resistant to mechanical stresses.

3,576,940

FLAME-RETARDANT WIRE AND CABLE

John G. Stone, North Haven; George S. Buettner, and Christian A. Alm, Cheshire, Conn., assignors to Cerro Corporation, New York, N.Y.

Filed Dec. 3, 1968, Ser. No. 780,644
Int. Cl. H01b 7/28
U.S. Cl. 174—113 **19 Claims**



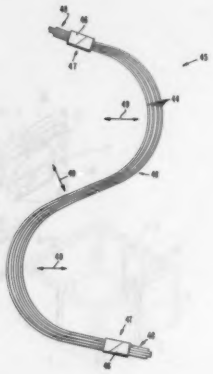
An electrical conductor or cable, capable of maintaining electrical integrity when exposed to open flame temperatures of 1000° F. without propagating a fire or resulting in falling burning particles or generating large volumes of smoke. The conductor or cable of this invention is comprised of a metallic conductor or plurality of conductors covered by a layer of primary insulation. Such conductors are then covered by a layer of silicone rubber which is, in turn, covered by a layer of glass fiber. The layer of glass fiber may then be covered by another layer of silicone rubber which is, in turn, covered by a layer of braided asbestos impregnated with an intumescent material. In the alternative, the second layer of silicone rubber may be covered by an asbestos tape which is then covered by a layer of elastomeric material having fire-retardant properties.

3,576,941

FLAT POWER-DISTRIBUTION CABLE

Donald F. Colglazier, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 696,595, Jan. 9, 1968, now abandoned. This application Aug. 6, 1969, Ser. No. 847,937
Int. Cl. H01b 7/08
U.S. Cl. 174—117 **15 Claims**



A flat cable for distributing electrical power between hingeable or demountable pieces of electrical apparatus is made up of thin, flat conductors nonrigidly mounted one on top of the other. The nonrigid mounting of the conductors relative to each other permits one to slip or slide relative to the other and thereby improve flexure of the cable and also increase the number of flexures the cable can be cycled through before it fails. Nonrigid mounting can be achieved by several different configurations. First, each flat conductor can be provided with its separate insulating layer and then the two insulated conductors may be held one over the other loosely so that they may slide or slip relative to each other. Second, a flat insulating cable may have a partition across its width so that one flat conductor may be placed in one partitioned section and the other flat conductor may be placed under the other conductor in the second partitioned section. Third, separately insulated conductors may be taped together at spaced locations so as to allow each conductor to slide within its own insulation and to allow relative movement of the conductors between the spaced locations.

3,576,942

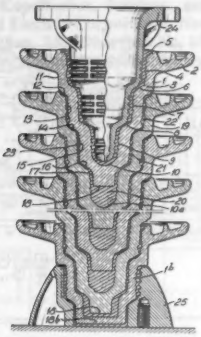
ELECTRIC INSULATORS WITH SPIGOTING ELEMENTS

Thomas Caldor, Saint-Yorre, Allier, France, assignor to Societe Sediver, Societe Europeenne d'Isolateurs en Verre, Paris, France

Filed May 20, 1969, Ser. No. 826,244
Claims priority, application France, May 22, 1968, 152,792
Int. Cl. H01b 17/14, 17/66, 19/00
U.S. Cl. 174—210 **6 Claims**

A method and apparatus for developing a column, which column comprises a plurality of substantially conical elements supporting one another in a spigoting arrangement, one seated in the other. The elements are connected to one another by a substance such as mortar. The walls of the elements are shaped such that when mortar is introduced in a

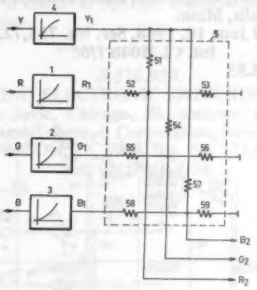
controlled manner into one of the elements, there is a controlled discharge of the temporarily fluidized mortar along the ducts of prescribed contour constituted by the opposing wall surfaces of an adjacent interfitted element.



3,576,943
COLOR TELEVISION MIXING ARRANGEMENT

Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Fernseh G.m.b.H., Darmstadt, Germany

Filed Aug. 30, 1968, Ser. No. 756,671
Claims priority, application Germany, Aug. 31, 1967, P 15 37 117.2
Int. Cl. H04n *9/32*
U.S. Cl. 178—5.4 **8 Claims**



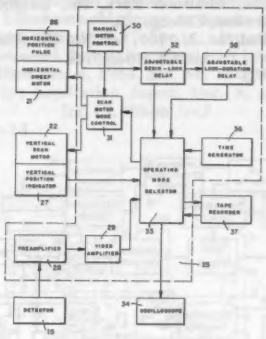
An arrangement in the transmission of color television. Color component signals are applied to amplifiers which, in turn, provide outputs mixed with the luminance signal component. The mixing is performed in a network of summing resistors. Each of the color component signals is mixed with a luminance signal component such that the latter has an amplitude which varies inversely with the amplitude of the luminance signal.

3,576,944
SCANNING RADIOMETER WITH PLURAL REFERENCE SOURCES

Kenneth B. LaBaw, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Jan. 28, 1969, Ser. No. 794,512
Int. Cl. G01j *5/52*; **H04n** *3/08, 7/18*
U.S. Cl. 178—6.8 **10 Claims**

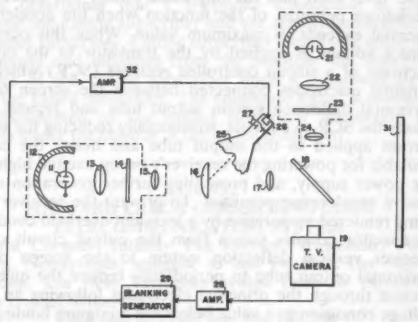
A scanning radiometer for producing long wave length infrared photographs and radiometric measurements. The instrument provides a raster type area scan by varying the horizontal and vertical field-of-view of the instrument. A detector produces a video signal which can be displayed on an oscilloscope and recorded with a camera to produce an area scanned picture.



3,576,945
APPARATUS FOR OPTICALLY INSETTING ONE IMAGE INTO ANOTHER IMAGE

William C. Ebeling, Binghamton, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.

Filed Mar. 24, 1969, Ser. No. 809,732
Int. Cl. H04n *1/38, 5/24*
U.S. Cl. 178—6.8 **7 Claims**



Apparatus is provided for insetting one image optically into a portion of another image. The apparatus includes two separate image generation and projection systems. A beam splitter combines the two images for projection onto a single viewing screen. One image projection system includes a field lens having one surface comprising an electroplastic film. A cathode ray is caused to sweep those portions of the film which represent the portion to be insetted by the other image. A TV camera system controls the generation of the cathode beam in response to an image projected through the beam splitter onto the TV camera. The portions of the film struck by the beam effectively occult corresponding portions of one image. The other image occupies the occulted portion.

ERRATUM

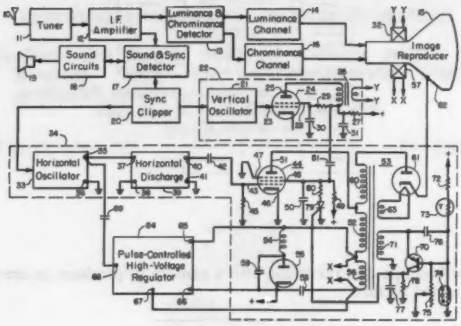
For Class 178—7.1 see:
Patent No. 3,577,200

3,576,946

POWER SUPPLY PROTECTION CIRCUIT UTILIZING A SILICON CONTROLLED RECTIFIER

Kenneth Frizane, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 3, 1969, Ser. No. 788,858
Int. Cl. H04n *5/44*
U.S. Cl. 178—7.3 **4 Claims**



A control circuit for preventing the application of accelerating potential in excess of a predetermined maximum value to the cathode-ray picture tube of a television receiver. Positive polarity pulses amplitude-related to the applied accelerating potential are derived from the receiver horizontal deflection system and impressed across the emitter-base junction of a transistor. The base of this transistor is biased at a DC level such that the impressed pulses will exceed the breakdown potential of the junction when the accelerating potential exceeds its maximum value. When this occurs a control voltage is applied by the transistor to the control electrode of a silicon controlled rectifier (SCR) which has principal electrodes connected between the screen of the horizontal deflection system output tube and ground. This causes the SCR to conduct, substantially reducing the screen current applied to the output tube and hence the energy available for powering the receiver's sweep-excited high voltage power supply, and preventing further generation of excessive accelerating potential. To prevent the receiver from being rendered inoperative by a transient overload condition, a capacitor couples pulses from the output circuit of the receiver vertical deflection system to the screen of the horizontal output tube to periodically reduce the quiescent current through the principal electrodes following an overvoltage condition to a value below the minimum holding current required to sustain conduction, thereby restoring the SCR to a nonconductive state and the high voltage power supply to an operative state. During a sustained overvoltage condition the control circuit causes the receiver to alternate between operative and nonoperative states, which "blinking" action on the receiver viewing screen effectively indicates a malfunction.

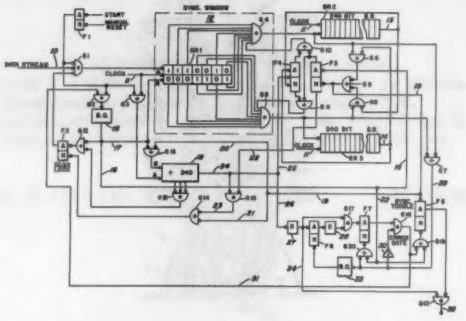
3,576,947

RAPID FRAME SYNCHRONISM OF SERIAL BINARY DATA

Lawrence W. Kruger, Newbury Park, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Jan. 16, 1969, Ser. No. 791,685
Int. Cl. H04n *1/32*
U.S. Cl. 178—69.5 **7 Claims**

A circuit means of detecting the synchronizing word in not more than two frames of serial binary information data having the serial data clocked through a shift register sync window and alternate gates for the sync word and its complement to a pair of frame bit shift registers to store the serial data for comparing consecutive frames for the sync word and its complement to produce an output signal after two consecutive frames of input data, any miss of sync word detec-



tion in two frames causing circuit switching to reset the circuit means for subsequent detection of the sync word.

ERRATUM

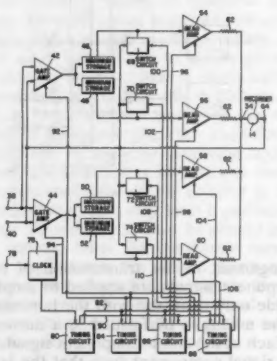
For Class 179—2 see:
Patent No. 3,577,201

3,576,948

SYSTEM FOR RECORDING HIGH FREQUENCY SIGNALS ON A RECORDER HAVING A LOWER FREQUENCY RESPONSE

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed June 10, 1968, Ser. No. 735,723
Int. Cl. H04b *1/66*
U.S. Cl. 179—15.55 **6 Claims**



A device is disclosed for recording high frequency signals on a lower frequency recorder. In accomplishing this, the high frequency signals are amplified and periodically stored in maximum and minimum storage devices. The stored maximum and minimum values of the high frequency signal are then sequentially applied through read amplifying circuitry to the lower frequency recorder which displays the signal retaining the amplitude thereof.

ERRATUM

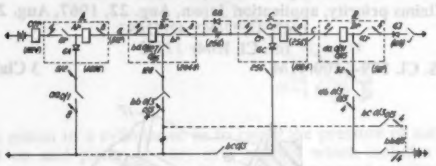
For Class 179—15 see:
Patent No. 3,577,202

3,576,949

MULTISTAGE SWITCHING NETWORK EMPLOYING CASCADED THREE-TERMINAL CROSSPOINTS

Frans Corneel Leo DeWit, Mortsel, Belgium, and Hans Helmut Adelaar, Kapellenbos, Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 18, 1968, Ser. No. 698,796
Claims priority, application Netherlands, Jan. 23, 1967, 6,701,051
Int. Cl. H04q 3/48
U.S. Cl. 179—18 7 Claims



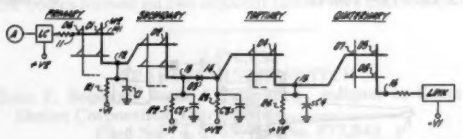
A multistage relay crosspoint network is disclosed in which a connection is held operated through the windings of the relays, each in series with its make contact. In a four-stage connection the hold contacts of the 1st and 2nd as well as those of the 3rd and 4th stages are serially connected and such hold connections replace similar parallel ones involving marking contacts. The invention substantially reduces the number of marking relays needed to establish connections by having the windings of the 1st and 2nd as well as those of the 3rd and 4th stages on the same side and by selecting, through access relay contacts, the desired crosspoints in the 1st and 3rd stages while marking rectifiers are used in the 2nd and 4th to enable bundles of marking wires to be selected in these stages in order to operate the desired crosspoints in these stages also.

3,576,950

SELF-SEEKING ELECTRONIC SWITCHING NETWORK

Nikola Ljotic Jovic, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,453
Int. Cl. H04q 3/50
U.S. Cl. 179—18 10 Claims



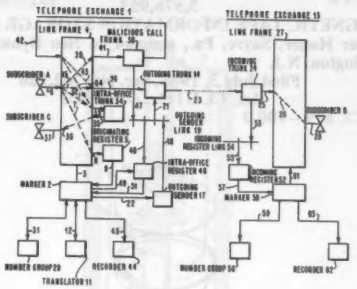
Primarily, this electronic switching network is used to enable the construction and operation of truly large scale networks without sacrificing the desirable aspects of self-seeking principles. In greater detail, a self-seeking current controlled network of PNPN diodes (or similar devices) is divided, by general purpose diodes, into a plurality of electrically isolated section. The isolation sets inherent limits on offensive fan-out currents and crosstalk, and it enables self-imposed node point priming. This is done by firing crosspoints at naturally occurring oscillation frequencies which inherently speedup as the self-selection process approaches the successful completion of a latched path. Initially the oscillation is at the naturally occuring cyclic firing frequencies of the end-marked diodes at either ends of the paths. At speedup, the oscillation becomes the entire path leaping back and forth between the end-marked points. Finally, the path selection process is completed when current flows over a completed path.

3,576,951

CALLING SUBSCRIBER IDENTIFICATION SYSTEM

Tomomi Uchida; Takeshi Kondo, Tokyo-to; Hiroshi Takada, Kawasaki-shi; Hiroaki Eguchi, Tokyo, and Kenichi Hasegawa, Yokohama-shi, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan and Fusitsu Limited, Kawasaki, Japan, fractional part interest to each

Filed Dec. 4, 1968, Ser. No. 781,048
Claims priority, application Japan, Dec. 9, 1967, 42/78280
Int. Cl. H04m 3/42
U.S. Cl. 179—18 2 Claims



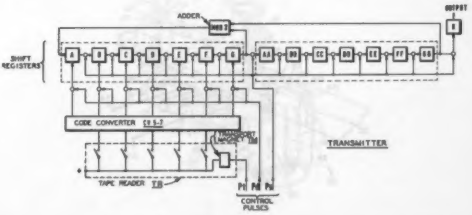
A calling subscriber identification system in an automatic telephone exchange system determines the telephone number of a calling subscriber upon the calling subscriber making a telephone call to a called subscriber. The telephone number of the called subscriber is determined. Subscriber-determining apparatus determines if the called subscriber is a specific subscriber in accordance with the telephone number of the called subscriber. A recorder records the telephone number of the calling subscriber when the subscriber determining means determines that a telephone connection is made between the calling subscriber and the specific subscriber as the called subscriber. Calling subscriber identifying apparatus determines and indicates from the recorder the telephone number of the calling subscriber upon a command signal from the called subscriber. The command signal is produced and transmitted to the calling subscriber identifying apparatus under the control of the called subscriber.

3,576,952

FORWARD ERROR CORRECTING CODE TELECOMMUNICATING SYSTEM

Hendrik Cornelis Anthony Van Duuren, Wassenaar, Voorburg, Netherlands, assignor to and De Staat Der Nederlanden, Ten Deze Vertegenwoordigd Door De Directeur, The Hague, Netherlands

Filed Jan. 6, 1969, Ser. No. 789,340
Claims priority, application Netherlands, Jan. 19, 1968, 6800871
Int. Cl. H04l 1/10
U.S. Cl. 178—23.1 11 Claims



A multielement code telecommunication system comprising first converting each code signal into a constant ratio 1-bit/0-bit signal, storing a predetermined successive number of such converted code signals in shift registers to form a group,

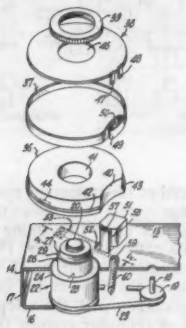
and forming a test signal by modulo 2 adding the bits in said group of signals which test signal is transmitted with and after each said group to form a block of signals; receiving and storing in shift registers each signal in said group, testing each signal as it is received and if one and only one signal in said group is found mutilated or erroneous, clearing the shift register in which that erroneous signal is stored and reconstructing therein the correct signal from said test signal and the other correctly received signals in that group; and lastly reconverting said correct group of signals and transferring them from printing registers successively to a printer.

3,576,953

MAGNETIC TAPE INFORMATION STORAGE DEVICE

Werner Hauer, Sayre, Pa., assignor to Neo Dynamics, Inc., Irvington, N.J.

Filed July 3, 1968, Ser. No. 742,226
Int. Cl. G11b *5/76, 25/02*
U.S. Cl. 179—100.2 **7 Claims**



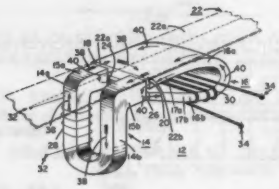
An information storage device includes a rotatable drum having an anchoring element spaced from the periphery thereof. A magnetic recording tape extends around the periphery of the drum and has a tail engaging the anchoring element to provide a free path between the tape and the drum periphery for the reception of a spring biased member which urges the tape into sliding engagement with the opposing face of a magnetic transducer. In one form the drum is provided with a separable end plate provided with a pair of closely peripherally spaced longitudinal legs, and the tape is in the form of an endless ring looped about the leading and trailing edges of respective legs.

3,576,954

METHOD OF LOW POWER BIAS, LOW DISTORTION MAGNETIC RECORDING

Edward C. Sand, Willoughby, Ohio, assignor to Clevite Corporation

Filed Sept. 16, 1968, Ser. No. 759,842
Int. Cl. G11b *5/02, 5/44*
U.S. Cl. 179—100.2 **5 Claims**



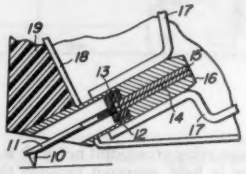
A method of magnetic recording is provided which utilizes an AC signal flux recorded in conjunction with DC bias flux which biases the magnetic tape to the knee portion of the remanent magnetization characteristic of the magnetic record medium. By using two tracks in the same medium and suitable distribution of signals, the method provides low distortion overall although each individual track is severely distorted.

3,576,955

ARMATURE ASSEMBLY FOR MAGNETIC-TYPE PHONOGRAPH PICKUP

Shuichi Obata, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Oaza Kadoma, Kadoma-shi, Osaka, Japan

Filed Aug. 16, 1968, Ser. No. 753,236
Claims priority, application Japan, Aug. 22, 1967, Aug. 22, 1967, 42/72682; 42/72683
Int. Cl. H04r *11/12*
U.S. Cl. 179—100.41M **3 Claims**



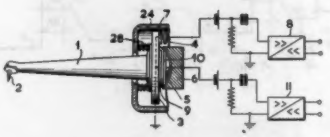
An armature assembly for a magnetic-type phonograph pickup having a cord or wire which supports a stylus arm with a magnet mounted thereon, the armature, being supported by the aid of the bending of the cord or wire at one stable point to vibrate uniformly in every direction at that point; and a bearing member of elastic material the compression of which can be adjusted so that at the peak the resonant frequency of the output voltage can be damped, such that the frequency response characteristic of the output voltage can be flattened.

3,576,956

STEREOPHONIC PHONOGRAPH TRANSDUCER

Cornelis Lanooy, and Herbert Mensen, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 20, 1959, Ser. No. 814,556
Claims priority, application Netherlands, June 20, 1958, 228,905
Int. Cl. H04r *11/12, 19/10*
U.S. Cl. 179—100.41 **6 Claims**



A phonograph pickup, particularly for stereophonic recording and reproduction in which a body for converting movements of a stylus is suspended within a housing to be tiltable in all directions.

3,576,957

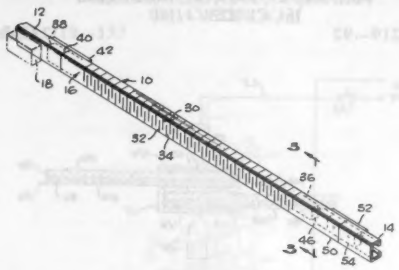
PANTOGRAPHS

Arnold Tustin, Tring, England, assignor to British Railways Board, London, England

Filed Feb. 6, 1969, Ser. No. 797,028
Int. Cl. B60l *5/08*
U.S. Cl. 191—60.3 **11 Claims**

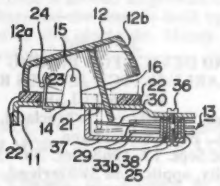
This invention provides an arrangement for the supply of electric current to vehicles, which includes a servosystem providing compensation for inertial forces so as to maintain a

contact member in electrically conductive connection with a conductor extending along the length of a track along which a vehicle runs. The servosystem includes a slug whose inertia is utilized to effect variation of the pressure of a fluid acting



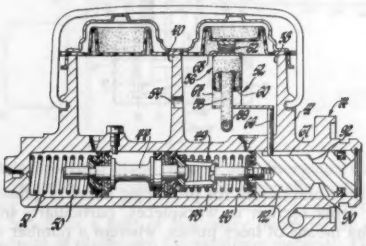
on a piston in a cylinder so as to cause the pressure of such fluid on said piston to vary in a manner which includes a component proportional to upward and downward accelerations of the contact member and in the same sense.

3,576,958
SWITCHING DEVICE WITH IMPROVED TABLET ACTUATOR MEANS
Junji Ohno, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed Feb. 27, 1969, Ser. No. 802,368
Claims priority, application Japan, Apr. 13, 1968, Apr. 17, 1968, Apr. 19, 1968, 43/29886;43/30983;43/31689
Int. Cl. H01h *9/00*
U.S. Cl. 200—1 **9 Claims**



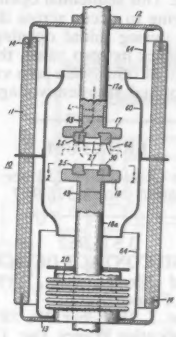
The switching device of a tablet type comprises a plurality of tablets each having bosses formed integrally on the surfaces of its sidewalls coaxially with bores formed in the tablets to receive an axis. The tablets are arranged on a base by passing the axis through said bores in such a manner that the bosses formed on two adjacent tablets face each other.

3,576,959
BRAKE WARNING SWITCH
John P. Bogosoff, Battle Creek, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 4, 1969, Ser. No. 873,843
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 **8 Claims**



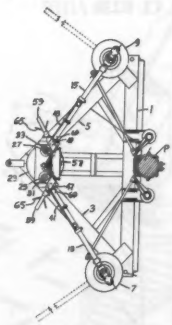
A vehicle brake system master cylinder assembly is provided with a switch assembly employing a float to monitor both fluid level in a reservoir and excessive travel of a fluid-pressurizing piston. The float itself responds to the fluid level and an upper float travel limit is established in accordance with the piston position.

3,576,960
FLANGE FASTENING MEANS FOR A CONTACT BUTTON FOR A VACUUM-TYPE CIRCUIT INTERRUPTER
Donald R. Kurtz, Malvern, Pa., assignor to General Electric Company
Filed Mar. 8, 1968, Ser. No. 711,759
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 **4 Claims**



Contact structure for a vacuum-type circuit interrupter comprising a contact containing an annular groove surrounding an integral central boss. An annular contact-making button is fitted in the groove and is secured in place by deforming the outer periphery of the boss to define an integral lip extending radially outwardly from the boss, overlapping a radially inwardly projecting shoulder on the button, and tightly sandwiching the shoulder against the bottom of the groove.

3,576,961
VACUUM SWITCH WITH OPERATING MEANS FOR ARRESTING CONTACT IN AN INTERMEDIATE POSITION BEFORE COMPLETE OPENING
John L. Turner, East St. Louis, Ill., assignor to Turner Electric Corporation, East St. Louis, Ill.
Filed Aug. 2, 1968, Ser. No. 749,719
Int. Cl. H01h *33/66, 3/52*
U.S. Cl. 200—144 **11 Claims**



Mechanism for operating a load interrupter switch responsive to opening and closing movements of an air break switch or a plurality of the latter. The load interrupter switch contacts are enclosed in a vacuum bottle preferably, one contact being fixed and the other movable axially away therefrom to

open position and toward the fixed contact to closed position. The movable contact is biased toward open position and is normally held in closed position by a lever pivoted at one end and extending transversely of the direction of movement of the contact. The lever is normally maintained in the contact-closed position by a rotatable cam. A latch member extending transversely of the lever normally overlies one end of the lever and when the cam is rotated to permit initial movement of the lever the end of the latch becomes engaged with the end of the lever, permitting a slight initial opening movement of the lever and the associated contact for a period of two to three cycles. Further movement of the cam causes another projection on it to engage the latch, keeping it clear of the end of the lever and permitting the lever to move freely, thus freeing the contact to move under spring pressure to its full open position. This sequential opening of the contact permits harmless arcing to occur across the contacts within the vacuum bottles during initial opening of the contacts until the current reaches its zero value, thus avoiding interruption of the current at other than zero values and the consequent occurrence of high transient voltages.

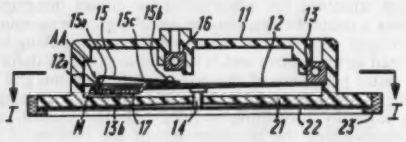
ERRATUM

For Class 200—151 see:
Patent No. 3,576,967

3,576,962
PUSH CONTACT DEVICE

Jean-Pierre Edmond Nicolas, Nice, France, assignor to Legrand, Limoges, France

Filed Dec. 5, 1968, Ser. No. 781,408
Claims priority, application France, Dec. 13, 1967, 132,124
Int. Cl. H01h *9/18, 3/12*
U.S. Cl. 200—167 **9 Claims**

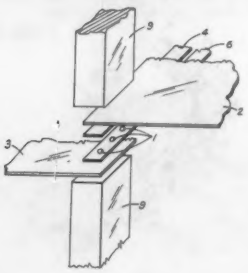


A push contact device having a small control travel intended for controlling electrical apparatus by current impulses. An operating pushrod projects freely from the center of a concave baseplate by a deformable operating plate against which the said pushrod is supported.

3,576,963
WELDING METHOD

Freeman M. Vowels, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 3, 1968, Ser. No. 757,169
Int. Cl. B23k *11/10*
U.S. Cl. 219—92 **4 Claims**

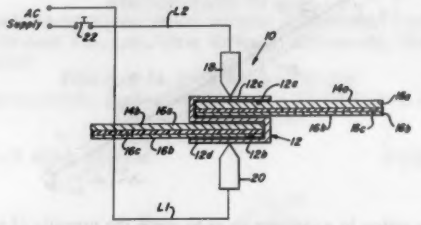


A method of resistance welding electrically conductive bodies together wherein projection means and sealing means are positioned between overlapped portions of such bodies, the bodies then being subjected to pressure and current to seal and weld the bodies together.

3,576,964
WELDED JOINT

Alvin R. Williams, Northfield, Ohio, assignor to United States Steel Corporation

Filed May 27, 1969, Ser. No. 828,296
Int. Cl. B23k *11/10*
U.S. Cl. 219—92 **7 Claims**

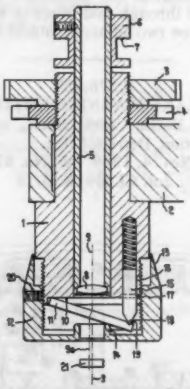


A welded joint is disclosed having an S-shaped metal connector provided with a first laminate cavity and a second laminate cavity, a first adhesively bonded laminate disposed in the first laminate cavity, and a second adhesively bonded laminate disposed in the second laminate cavity. The first adhesively bonded laminate and the second adhesively bonded laminate, each has a first metal member, a second metal member and an electrically insulating adhesive between the first metal member and the second metal member. The first adhesively bonded laminate and the second adhesively bonded laminate are disposed in the first laminate cavity and the second laminate cavity respectively so that the first metal members and the second metal members are in contact with the metal connector and are welded together.

3,576,965
METHOD AND DEVICE FOR BORING WORKPIECES, PARTICULARLY WATCH JEWELS BY MEANS OF LASER PULSES

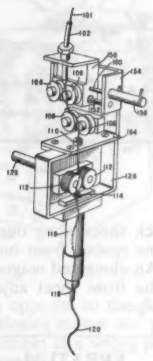
Gottfried Gugger, Steffisburg, Switzerland, assignor to Laser Technique SA., Bern, Switzerland

Filed Sept. 13, 1968, Ser. No. 759,664
Claims priority, application Switzerland, Sept. 25, 1967, 13357/67
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **26 Claims**



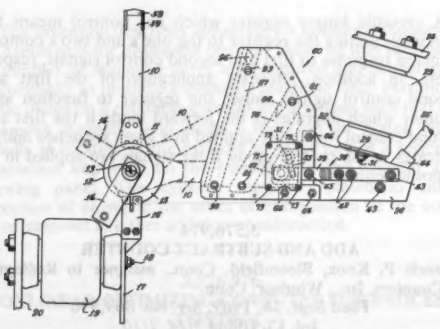
A method and device for producing bores of substantially circular cross section in workpieces, particularly in watch jewels, by means of laser pulses, wherein a number of laser pulses successively produced by a laser source are directed into an optical deflecting system wherein the laser beam is deflected from its axis of incidence, successive laser pulses being thereby distributed by said rotating deflecting system on a path round the axis of the bore to be produced.

3,576,966
ARC-WELDING IN NARROW GAP
Cornelius J. Sullivan, Berkeley Heights, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Filed Mar. 27, 1967, Ser. No. 626,026
Int. Cl. B23k *9/12*
U.S. Cl. 219—137 2 Claims



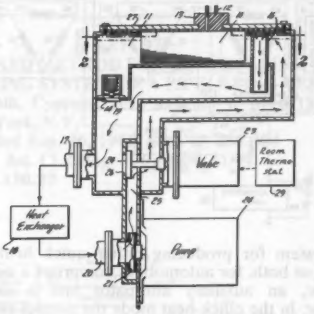
A welding wire of serpentine form is fed into an electric arc in a narrow gap between workpieces to be joined, the wire passing through a contact tube which is sheathed in electrical insulation to avoid short-circuiting to the workpieces, the serpentine form of the wire serving to direct the arc toward one side of the gap or the other in periodic oscillations as the electrode is moved lengthwise of the gap from one end to the other, and the seam is built up layer by layer in repeated passes of the electrode. Means are shown for bending the wire to the desired form.

3,576,967
SWITCH CONSTRUCTION WITH LOAD BREAK DEVICE HAVING ONE OR MORE MOVABLE SLATS WITH HEAT SPACERS
James E. Jeffries, Chicago, Ill., assignor to S & C Electric Company, Chicago, Ill.
Filed Apr. 4, 1969, Ser. No. 813,541
Int. Cl. H01h *33/06*
U.S. Cl. 200—151 6 Claims



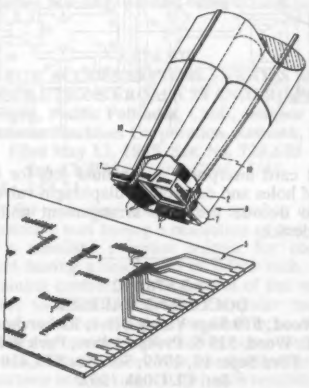
A rotatable switch blade engages and disengages stationary contact assembly through a slot in a generally sector-shaped insulating housing enclosing the contact assembly and formed by either a pair of stationary plates or by a single molded piece of plastic arc extinguishing material. The housing has one or more generally radially extending slats of plastic arc extinguishing material which are located in a groove or grooves on one side of the slot and are biased transversely into a registering groove or grooves on the other side of the slot. The distal end of the switch blade successively engages the outer ends of the slats and displaces them transversely of the slot as the switch blade rotates toward the switch closed position. The reverse procedure occurs when the switch blade rotates toward the switch open position accompanied by arc confining and extinguishing action of the slat or slats and the housing.

3,576,968
ELECTRODE HEATING SYSTEM
Robert L. Collie, Orange County (2707 Catalina Drive) Orlando, Fla.
Filed May 19, 1969, Ser. No. 825,556
Int. Cl. H05b *3/60*; F28d *15/00*
U.S. Cl. 219—284 10 Claims



An electrode heating apparatus for controlling the heat output in an electric heating system by varying the level of an electrolyte solution in a heating chamber having electrodes therein. A heat exchanger is connected to the heating chamber for utilizing heat generated in the electrolyte solution and provision is made for a quick heat up of the electrolyte solution. Thermostatic valves control the flow of the electrolyte solution into and out of the heating chamber and thus the level of the electrolyte in the chamber which in turn determines the rate of heating of the electrolyte solution by the area of the electrodes covered by the electrolyte solution.

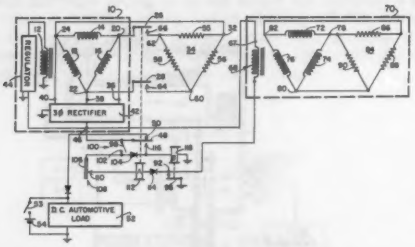
3,576,969
SOLDER REFLOW DEVICE
Rohinton J. Surty, Redwood City, Calif., and Conrad Trollmann, Baden Wurttemberg, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 2, 1969, Ser. No. 854,396
Int. Cl. B23k *3/02*; H05b *3/10*
U.S. Cl. 219—221 1 Claim



Disclosed is a device for simultaneously soldering numerous integrated circuit chip leads to a circuit board. The

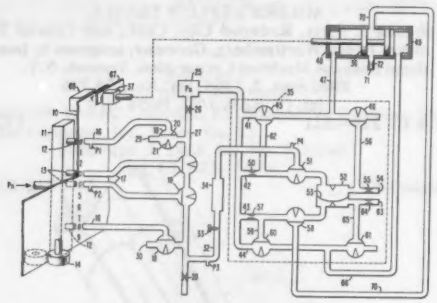
device is characterized by having a heating tip made of refractory, electrically insulative, thermally conductive, material. Fused to this tip is a coat of penetrating metallic paste. The paste is disposed on the tip in an electrically continuous path. Heating is accomplished by passing current through this metallic paste path.

3,576,970
QUICK HEAT AND ELECTRICAL POWER-PRODUCING SYSTEM
James R. Cherry, Barrington, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Oct. 1, 1969, Ser. No. 862,785
Int. Cl. F27d *11/00*
U.S. Cl. 219—279 **6 Claims**



A system for producing either quick heat or electrical power, or both, for automobiles comprises a conventional alternator, an auxiliary alternator and a control system therefor. In the quick-heat mode the control system connects the field winding of the auxiliary alternator to load the output of the conventional alternator thereby avoiding the generation of voltage transients. If quick heat is not desired, the conventional alternator provides only electrical power and the auxiliary alternator has no output.

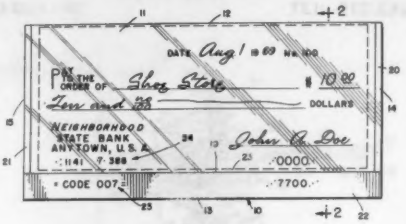
3,576,971
FLUID-ACTUATED TRANSLATING APPARATUS
Richard E. Norwood, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 8, 1967, Ser. No. 644,584
Int. Cl. G06k *7/02*
U.S. Cl. 235—61.11 **6 Claims**



Punched card interpreter using fluid jets for sensing the presence of holes and controlling diaphragm valves and fluid pressure to decode the hole arrangement and operate a recording device.

3,576,972
DOCUMENT CARRIER
Daniel J. Wood, 510 Sage Valley Drive, Richardson, Tex., and Harold E. Wood, 329 S. Prospect Ave., Park Ridge, Ill.
Filed Sept. 12, 1969, Ser. No. 857,410
Int. Cl. G06k *19/02*
U.S. Cl. 235—61.12R **2 Claims**

A document carrier envelope for processing checks through automatic magnetic character recognition sorting equipment. The document carrier includes generally rectangular back and front sheets of approximately the same size. The front sheet is formed of relatively translucent material so that a check carried by the document carrier can be read, photographed or microfilmed and the front sheet is adhesive-

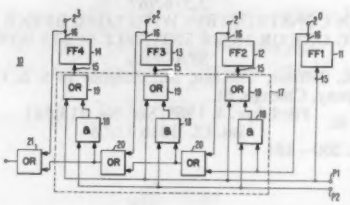


ly secured to the back sheet along one of the shorter side edges and along a line spaced from one of the longer side edges of the sheets. An elongated magnetic indicia-receiving strip is secured to the front sheet adjacent the adhesively secured longer side edges.

ERRATUM

For Class 235—61—114 see:
Patent No. 3,577,203

3,576,973
BINARY REGISTER
Wilburn D. Draper, Thousand Oaks, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 30, 1969, Ser. No. 820,400
Int. Cl. G06m *3/14*; **H03k** *21/06*
U.S. Cl. 235—92 **16 Claims**

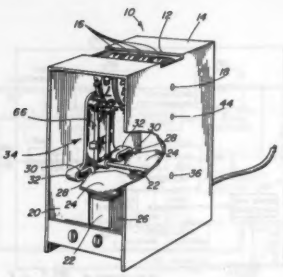


A versatile binary register which has control means for selectively setting the register to the one's and two's complements in response to first and second control signals, respectively. In addition, alternate application of the first and second control signals causes the register to function as a counter which operates in the forward mode if the first and second control signals are applied in a given sequence and/or operates in the reverse mode if the signals are applied in an opposite sequence.

3,576,974
ADD AND SUBTRACT COUNTER
Francis P. Knox, Bloomfield, Conn., assignor to Redington Counters, Inc., Windsor, Conn.
Filed Sept. 26, 1969, Ser. No. 869,996
Int. Cl. G06m *3/14*, *1/10*
U.S. Cl. 235—92C **13 Claims**

A counter has a novel drive assembly including a pinion cooperating both with a number wheel and also with an oscillatable ratchet to permit selective adding and subtracting. The pinion member has two adjacent axial portions with each portion having teeth spaced about the circumference. The number wheel is in meshing engagement with a first portion of the pinion member and the ratchet is mounted for oscillation adjacent the second portion thereof. Biasing means is provided to urge a tooth of the pinion member into engage-

ment with suitable means on the ratchet when the ratchet is in either of two positions spaced from a neutral point therebetween, so that return of the ratchet to its neutral point from one of those positions causes rotation of the



pinion in a direction opposite to the direction of oscillation of the ratchet. The biasing means also prevents engagement of a tooth with the ratchet at a wrong point during the cycle to avoid spurious action.

3,576,975

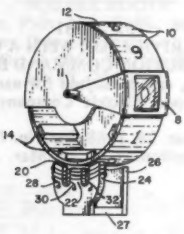
REVERSIBLE COUNTER WITH READOUT

Joachim A. Maass, 3212 Querns Road, Belmar, N.J.

Filed June 14, 1968, Ser. No. 737,130

Int. Cl. G06m *3/14*

U.S. Cl. 235—92 **2 Claims**



The invention describes apparatus for counting a sequence of events and for displaying the final count of that sequence. A number of magnetic cores are energized and deenergized sequentially to produce a changing magnetic field. Ferromagnetic plates on a rotatable cylinder are arranged such that the changing magnetic field exerts a force on the plates which results in rotation of the cylinder to place any of a series of characters imprinted on the periphery of the cylinder at a viewing panel. The cylinder may be rotated in either direction of changing the order of energization of the cores to correspond to either addition or subtraction.

3,576,976

NONLINEAR OPTIMIZING COMPUTER FOR PROCESS CONTROL

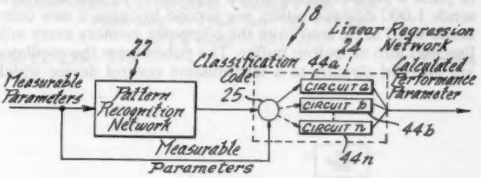
Frank A. Russo, Royal Oak, and Robert J. Valek, Farmington, Mich., assignors to The Bendix Corporation

Filed Oct. 19, 1967, Ser. No. 676,586

Int. Cl. G05b *13/02;* **G06k** *9/06*

U.S. Cl. 235—150.1 **7 Claims**

An apparatus for converting an input signal representing a set of measured process parameters such as temperature, vibration or torque into an output signal representing a set of nonmeasurable process performance parameters such as tool wear, surface finish or production costs having a pattern recognition circuit for classifying the measurable parameters into one of a plurality of classes and a linear regression net-



work for each class being selectable in accordance with the classification to calculate the performance parameters.

3,576,977

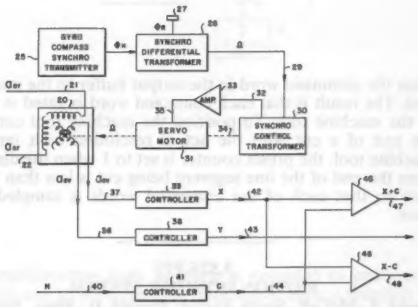
SYSTEM AND METHOD FOR CONTROLLING THE POSITIONING SYSTEM OF A PIPELAYING VESSEL

Robert H. Kolb, Cypress, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Aug. 26, 1968, Ser. No. 755,304

Int. Cl. G06g *7/70;* **B63b** *35/04*

U.S. Cl. 235—150.27 **4 Claims**



A system and method for controlling the movement, position and orientation of a pipelaying vessel in a manner designed to permit moving the vessel along a desired route while maintaining a desired tension in the pipe and while minimizing the bending forces in the pipe and pipe support structure which result from crosscurrents or misalignment of the vessel. Vessel movement along the route may be at a selected steady rate or may be intermittent and synchronized with the pipeline assembly process being conducted onboard.

3,576,978

SYSTEM FOR ACCOMODATING VARIOUS MACHINE TOOL RESOLUTIONS FROM A STANDARD PROGRAM

Jack Rosenberg, Pacific Palisades, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

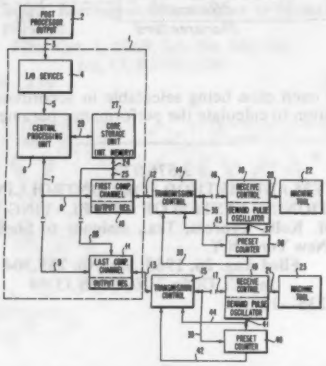
Filed May 13, 1968, Ser. No. 728,685

Int. Cl. B23g *21/00;* **G06f** *15/46*

U.S. Cl. 235—151.11 **10 Claims**

A system for providing the correct number of pulses to drive any machine tool having a resolution of less than 0.001 inch from a standard program written for control of a machine tool having a resolution of 0.001 inch. Command words containing control bits for control of the various axes of a machine tool are stored in a computer memory and gated out under control of pulses provided by an oscillator. If a command word from the buffer of the computer memory is gated out each millisecond and the standard program is written for a machine tool having a 0.001 inch resolution, a maximum vector feedrate of 60 inches per minute can be provided. If the machine tool which is to be controlled has a resolution of u inches and m=0.001/u is an integer, which is

the usual case, the frequency of the pulses as well as the number of pulses in the pulse train must be modified. An oscillator which produces 1,000 *m* pulses per second is used to pulse a preset counter which is preset to *m* and therefore, sends 1,000 demand pulses per second to cause a new command word to be read from the computer memory every millisecond into an output buffer. The pulses from the oscillator are also fed directly to a transmission control device which



gates the command word in the output buffer to the machine tool. The result is that each command word is gated *m* times to the machine tool. To position the machine tool cutter at the end of a cut with the actual resolution built into the machine tool, the preset counter is set to 1 when the distance from the end of the line segment being cut is less than 0.001 inch so that each of the command words is sampled only once.

3,576,979

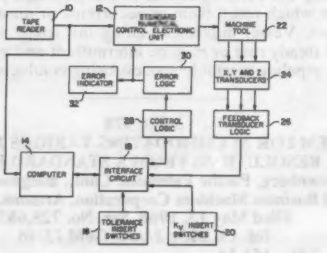
MOTION MONITOR SYSTEM

Amiel J. McCall, South Euclid; Ronald D. Elms, Mayfield Heights, and Larry D. Rice, Novelty, Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 24, 1968, Ser. No. 762,097

Int. Cl. G06f *15/46*; G05b *19/18*

U.S. Cl. 235—151.11 **7 Claims**



A system for monitoring the motion of a numerically controlled machine tool to avoid costly errors. The motion command data that is normally supplied to the machine tool is also supplied to the monitoring system. Additionally, data from the machine tool slide transducers representative of the actual machine tool motion are fed back to the monitoring system. Tolerance data are also supplied to the monitoring system. On the basis of the data supplied thereto, the monitoring system continually determines whether or not a sufficient error exists to shut down the machine tool.

3,576,980

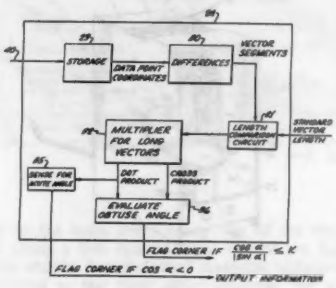
AUTOMATIC CORNER RECOGNITION SYSTEM

Harold W. Doyle, Newport Beach, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.

Filed Mar. 28, 1968, Ser. No. 716,918

Int. Cl. G06f *7/38*

U.S. Cl. 235—152 **6 Claims**



The angular change between successive line segments connecting consecutive data points defining a sample shape may be used to determine corners for controlling automatic pattern grading. When the segments are represented in vector notation the angular evaluation may be conveniently determined from the dot and cross product of the angle-forming vectors. Where long vectors are separated by short vectors, a corner reconstruction technique can be employed to locate a vertex approximately representative of the original sample shape.

3,576,981

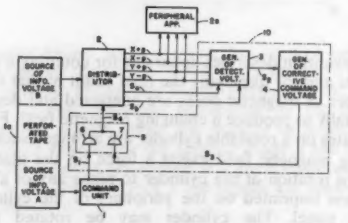
DIGITAL INTERPOLATOR WITH A CORRECTIVE DISTRIBUTION COMMAND DEVICE

Kiyokazu Okamoto, and Masayuki Miyazaki, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 28, 1968, Ser. No. 716,954

Claims priority, application Japan, Mar. 31, 1967, 42/20527

U.S. Cl. 235—152 **16 Claims**

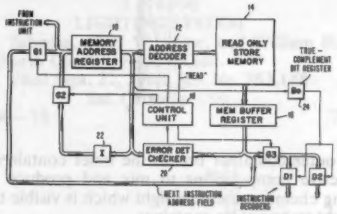


A corrective digital interpolator providing sequential steps in X and Y coordinates for tracing new curves from a prototype curve and for minimizing deviations of the new curve from the prototype curve, comprising translating coordinate signals and distribution signals representing, for example, a direction (vertical) other than the direction (horizontal) corresponding to a maximum component (horizontal) of a vector at different followup points, translating the other signals into corrective signals in such manner that the latter signals have a ratio of 3 to 2 relative to the other signals, and translating distribution command rate signals and corrective signals into corrected command rate signals for minimizing the deviations of the new curves from the prototype curve, the latter signals comprising logic sums of the distribution command rate signals and the corrective signals.

3,576,982
ERROR TOLERANT READ-ONLY STORAGE SYSTEM

Keith A. Duke, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1968, Ser. No. 783,925
Int. Cl. G11c 29/00; G06f 11/00
U.S. Cl. 235—153 9 Claims

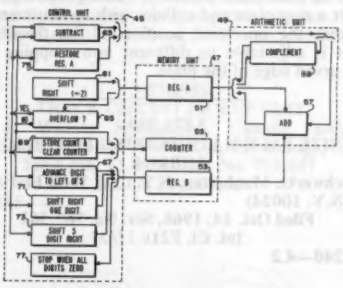


A read-only storage system wherein each data word is stored twice, once in its true form and once in its complement form. Said two data words are further stored at complementary addresses and means are provided upon readout of any data word for detecting a system error. Said means being further operative to automatically access an address complementary to the one currently being utilized for reading out the same data word in the complementary form at said complementary address.

3,576,983
DIGITAL CALCULATOR SYSTEM FOR COMPUTING SQUARE ROOTS

David S. Cochran, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 2, 1968, Ser. No. 764,436
Int. Cl. G06f 7/48
U.S. Cl. 235—158 6 Claims

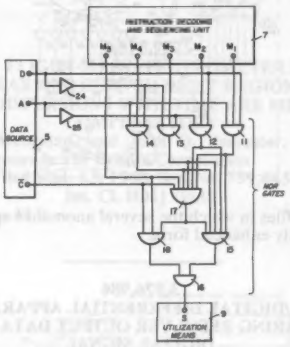


In a data processing system, a control unit is provided for controlling the functions and operational sequence of a memory unit and an arithmetic unit so as to derive the square root of any given number. The control system includes two iterative control loops, the first of which initially subtracts a predetermined subtrahend term from one-half of the given number. Thereafter this control loop successively subtracts an incrementally advanced subtrahend term from the difference formed by the immediately preceding subtraction operation. The second iterative control loop reduces the degree of significance of the subtrahend digits when the difference formed by a subtraction operation is negative. The number of positive differences formed by the first control loop are counted and these counts represent the square root of the given number.

3,576,984
MULTI-FUNCTION LOGIC NETWORK

Roland S. Gregg, Jr., Canoga Park, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Aug. 9, 1968, Ser. No. 751,607
Int. Cl. G06f 7/385, 7/38
U.S. Cl. 235—176 13 Claims



A multifunction logic network is provided to perform a selected one of a plurality of operations, each a function of one, two or three variables and five control signals. A first plurality of gates provide all possible AND functions of two variables A and D, each in response to a separate control signal. A fifth gate then provides all possible inverted functions of a third variable C when true and one or more of the other variables A and D in response to the output signals of the first four gates and a fifth control signal. All possible AND functions of two variables are then combined by a sixth gate with the output of the fifth gate. A seventh gate provides all possible inverted functions of the third variable C when false and the other variables A and D in response to the output of the fifth gate and the fifth control signal. An eighth gate effectively OR's the complements of the sixth and seventh gates to provide all of 30 possible functions of one or more of the variables A, D and C. The remaining two operations consist of selectively transmitting one of two possible binary constants.

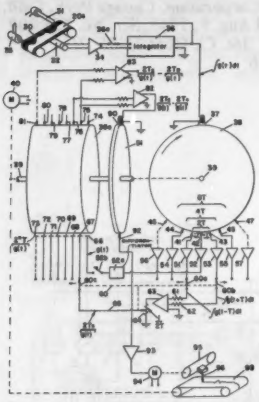
3,576,985
METHOD OF AND MEANS FOR TREATING GRAVITY PROFILES

Philip L. Lawrence, Riverside, Conn., assignor to Mobil Oil Corporation

Continuation of application Ser. No. 214,973, Aug. 6, 1962, now abandoned. This application Sept. 20, 1967, Ser. No. 669,314
Int. Cl. G06g 7/19; G01v 7/36
U.S. Cl. 235—181 16 Claims

A gravity profile containing gravitational anomalies is utilized and treated to provide information as to depths of the sources of the anomalies. The initial measurements of gravity potential along the line of exploration making up the gravity profile are corrected for change in elevation and a plurality of averaged gravity profiles are generated. The generated

profiles are subtracted from one another to generate difference profiles in which the several anomalies appear in turn and in greatly enhanced form.

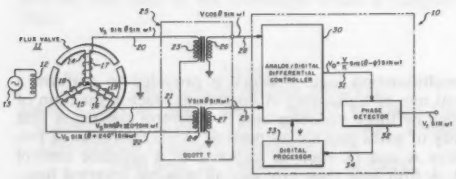


3,576,986

ANALOG/DIGITAL DIFFERENTIAL APPARATUS FOR COMPARING RESOLVER OUTPUT DATA WITH A DIGITAL SIGNAL

David R. Brickner, and Billy K. Swift, Phoenix, Ariz., assignors to Sperry Rand Corporation

Filed Jan. 14, 1969, Ser. No. 790,987
Int. Cl. G06g 7/22; G06j 1/00
U.S. Cl. 235—189 **13 Claims**



Apparatus for comparing an analog input signal with a digital input signal and providing an analog output signal proportional to the difference therebetween, said apparatus comprising an analog/digital differential controller including digital-to-analog converters responsive to the more significant bits of the digital signal and operating in combination with multiplier and subtractor devices for establishing a coarse relationship between the analog and digital input signals and supplying an accurate reference voltage to a fine resolution digital-to-analog converter which is responsive to the less significant bits of the digital signal to produce fine data for summing with the coarse data and thereby form the output signal.

3,576,987

CHEMICAL LIGHTING DEVICE TO STORE, INITIATE AND DISPLAY CHEMICAL LIGHT

Heinz Kurt Walter Voight, Ridgefield, and Robert Lee Myers, Darien, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 674,296, Oct. 10, 1967, now abandoned. This application Nov. 7, 1968, Ser. No. 777,987
Int. Cl. F21k 2/00
U.S. Cl. 240—2.25 **6 Claims**

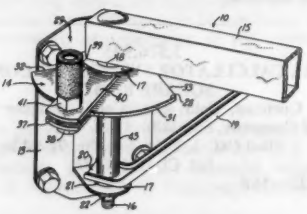
A device for providing chemiluminescent light from a chemical reaction of suitable compounds in the presence of a fluorescent compound, the device being a self-contained light unit, the device comprising an outer flexible, cylindrical, light transmitting container for one reactive composition, and an inner, rigid container for another reactive composition. Flexing the outer container breaks the inner container, allowing the reactive compositions to mix and produce a reaction providing chemiluminescent light which is visible through the outer light transmitting container.

3,576,988

ADJUSTABLE STOP FOR SWINGABLE FLOODLIGHTS

Donald S. Henning, Thiensville, Wis., assignor to Phoenix Products Company, Inc., Milwaukee, Wis.

Filed June 6, 1968, Ser. No. 735,027
Int. Cl. F21p 1/00
U.S. Cl. 240—3 **7 Claims**



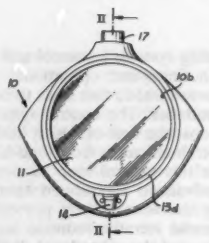
An arm structure that mounts a floodlight swings back and forth over a stop plate and collides with an abutment thereon that defines the operative position of the floodlight. The abutment is adjustable to different arm stopping positions along a curved edge of the plate.

3,576,989

PURSE-SIZE FACE-ILLUMINATING FLASHLIGHT AND MIRROR

Sidney Schwartz, Manhattan, N.Y. (375 West End Ave., New York, N.Y. 10024)

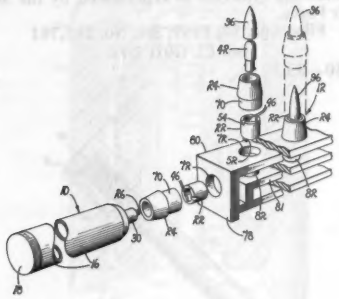
Filed Oct. 14, 1968, Ser. No. 767,362
Int. Cl. F21v 33/00
U.S. Cl. 240—4.2 **3 Claims**



A lady's handbag-size mirror is mounted in a molded plastic frame formed with a cavity extending diametrically

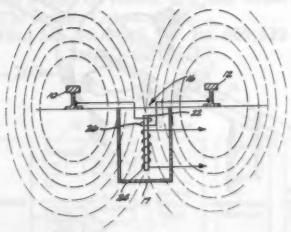
behind the mirror containing a dry cell battery. A lightbulb extends from one end of the cavity beyond the periphery of the mirror and is adapted to project light beams to the face of a user looking into the mirror. A removable depressible button extends from the other end of the cavity for actuating a normally open switch to light the bulb and permits access to the cavity for changing the battery and bulb. The frame is formed in mating halves which meet substantially in a plane parallel to that of the mirror.

3,576,990
LIGHTING SYSTEM
Wallace F. Johnson, 1287 W. Shaw, and William H. Tilson, 7560-A North Charles, Fresno, Calif.
Filed Sept. 27, 1968, Ser. No. 763,148
Int. Cl. F21p *1/00*
U.S. Cl. 240—10 **7 Claims**



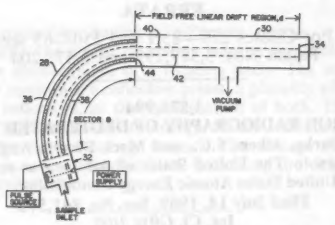
A versatile lighting system particularly characterized by a multiplicity of supporting bases, each conforming to a candlelike, truncated, frustoconical configuration surmounted by an interchangeable translucent, flame-shaped tip and including therein a miniature lamp disposed within a universal female receiver of a type particularly adapted to receive miniature lamp bases without regard to their configuration. The system electrically is connected in parallel with a portable source of electrical energy through a universal male connector seated in a receiver so that a plurality of radiating candlelike structures may be readily assembled for use as an ornamental lighting system in decorative schemes, including wall arrangements, centerpieces, floral arrays, and the like.

3,576,991
TRACK CIRCUIT PICKUP UNIT
Harlan J. Wilson, Sunnymead, Canada, assignor to Marquardt Industrial Products Co., Cucamonga, Calif.
Filed Jan. 23, 1969, Ser. No. 793,447
Int. Cl. B61l *21/00*
U.S. Cl. 246—40 **5 Claims**



Apparatus is described which detects the presence of a train within a given area. The apparatus includes a sensing unit which comprises an iron core transformer vertically positioned between the rails of a railroad track. A single-loop primary winding is coupled across the track. A secondary winding of the transformer is coupled to a receiver. At least one transmitter is coupled to the track at a predetermined distance from the sensing unit. The receiver detects secondary voltage induced by the track voltage applied to the primary winding. The wheel and axle of the train, when approaching the given area between the selected transmitter and the receiver, from the receiver end causes current to flow in the rails past the sensing unit, which through magnetic flux coupling to the sensing device adds in polarity to the magnetic flux in the core due to the primary winding, thereby increasing the signal induced into the secondary winding. This signal is detected by the receiver. When the train is within the given area between the selected transmitter and the receiver, the wheels and axle act as a shunt to short out any signals from the desired transmitter to the pickup unit.

3,576,992
TIME OF FLIGHT MASS SPECTROMETER HAVING BOTH LINEAR AND CURVED DRIFT REGIONS WHOSE ENERGY DISPERSIONS WITH TIME ARE MUTUALLY COMPENSATORY
Charles J. Moorman, and John Q. Parmater, Cincinnati, Ohio, assignors to The Bendix Corporation
Filed Sept. 13, 1968, Ser. No. 759,645
Int. Cl. H01j *39/36*
U.S. Cl. 250—41.9 **9 Claims**

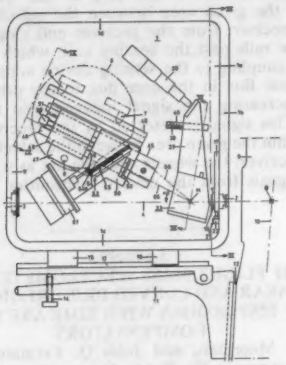


A mass spectrometer is disclosed which is based on the linear time-of-flight principle. Initial ion energies are compensated for by combining a curved drift region with a linear drift region so that ions of the same mass but differing energies reach the collector at the same time.

3,576,993
X-RAY CAMERA FOR X-RAY DIFFRACTION ANALYSIS ACCORDING TO GUINIER
Gunnar Hagg, Uppsala, Sweden, assignor to Incentive Research & Development AB, Bromma, Sweden
Filed Jan. 16, 1969, Ser. No. 791,731
Claims priority, application Sweden, Jan. 25, 1968, 1021/1968
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **11 Claims**

An X-ray camera for X-ray diffraction analysis of powderous material according to the Guinier method, which camera comprises an airtight and evacuatable casing having a radiation entrance window for X-ray radiation, in which casing all the components of the camera, as a crystal holder for a monochrometer crystal, a specimen holder for the specimen to be analyzed and a film holder, are mounted. The crystal holder is preferably removably mounted on a support plate which is rotatable about an axis perpendicular to the direction of the X-ray radiation incident through the entrance window of the casing. A support and guide rail can be mounted or positioned in anyone of a number of different positions in the casing radially extending from the axis of rotation of the support plate for the crystal holder. Two carriages are movably supported on the support and guide rail and lockable relative thereto in desired positions. One of the carriages carries the specimen holder, whereas the other car-

riage can be mechanically coupled or connected to the film holder so as to determine the position of the film holder. The



principal advantage of this X-ray camera is that it can easily and rapidly be adjusted for different wavelengths of the X-ray radiation used for the diffraction analysis.

ERRATA

For Classes 250—83.1 and 250—65 see:
Patent Nos. 3,577,199 and 3,577,204

3,576,994
NEUTRON RADIOGRAPHY OF DEUTERATED TISSUE

Paul B. Parks, Aiken, S.C., and Mark Brown, Augusta, Ga., assignors to The United States of America as represented by the United States Atomic Energy Commission.

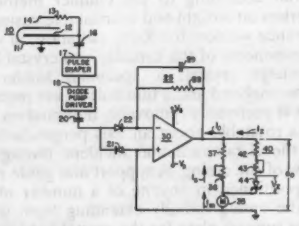
Filed July 14, 1969, Ser. No. 841,573
Int. Cl. G01t *3/00*
U.S. Cl. 250—83.1 5 Claims

An improved method of preparing a neutron radiograph of biological media by first contacting the media with a fluid containing deuterium such as deuterium oxide. The protium in the nonfatty tissue is replaced with deuterium to substantially reduce the neutron capture and scatter within the deuterated tissue. Consequently, the radiolucency of the nonfatty tissue is greatly increased. Deuterium does not significantly replace the protium in the fatty tissue which therefore remains radiopaque in contrast to the radiolucent nonfatty tissue.

3,576,995
RADIATION SURVEY METER COUNTING LOSS COMPENSATION CIRCUIT

Joseph C. Nirschl, West Long Branch, and G. Edgar Mooney, Jr., Pt. Pleasant, N.J.

Filed Dec. 2, 1968, Ser. No. 780,505
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 3 Claims

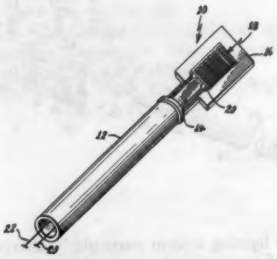


A radiation survey meter including a radiation detector, an operational amplifier and a current meter in the output circuit thereof wherein the counting loss error of the detector, which causes a reduction in current at high dose rate levels, is compensated for by means of a Zener diode connected in circuit with a resistive network in the output circuit of the operational amplifier. For higher radiation dose levels, the output voltage of the operational amplifier exceeds the voltage at which the Zener diode starts conducting. The resulting impedance change in the output circuit causes additional current flow in the current meter. By proper selection of a Zener diode and the resistance network associated therewith, the dead time effect of the radiation detector can be adequately compensated for.

3,576,996
INSTRUMENT FOR MEASURING THE NET FLUX OF RADIANT ENERGY THROUGH A PLANE

Donald W. Stevens, West Concord, Mass., assignors to The United States of America as represented by the Secretary of the Air Force.

Filed Apr. 14, 1969, Ser. No. 815,761
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 1 Claim

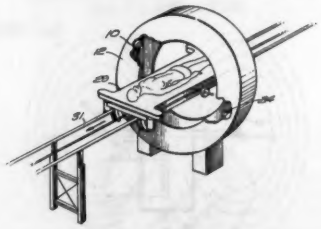


A pair of solar radiation-absorbing surfaces mounted on opposite sides of a probe utilize the Seebeck and Peltier effects to maintain equal surface temperatures thereby avoiding errors due to wind. The current produced by the effects is a measure of the net radiation.

3,576,997
PARTICLE ACCELERATOR EMPLOYING A REVOLVING ELECTRIC FIELD FOR GENERATING X-RAYS

Peter E. Slavin, Cambridge, Mass., assignor to Intelligent Instruments, Inc., Woburn, Mass.

Division of Ser. No. 469,505, July 6, 1965, Pat. No. 3,432,657, filed Sept. 24, 1968, Ser. No. 762,051
Int. Cl. G03b *41/16*
U.S. Cl. 250—90 6 Claims



A stereoscopic image is obtained from an X-ray scanning instrument in which the patient is moved along the axis of a rotating X-ray source with an X-ray receiver located oppositely the source and rotating with it to generate a helical scanning motion with respect to the patient. The X-ray receiver generates electrical signals which are recorded on magnetic tape and the tape is employed to operate a stereo

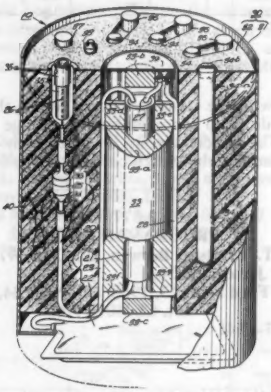
video system. A compact particle accelerator employing a revolving electrical field is provided for producing highly directional and monochromatic X-ray beams.

3,576,998

SELF CONTAINED, CLOSED SYSTEM AND METHOD FOR GENERATING AND COLLECTING A SHORT LIVED DAUGHTER RADIONUCLIDE FROM A LONG LIVED PARENT RADIONUCLIDE

Marshall E. Deutsch, Sudbury; Louis W. Mead, Lexington, and Zoltan Nagy, Quincy, Mass., assignors to Nen-Picker Radiopharmaceuticals, Inc., Boston, Mass.

Filed Nov. 16, 1966, Ser. No. 594,713
Int. Cl. G21g *5/00*
U.S. Cl. 250—106 **47 Claims**



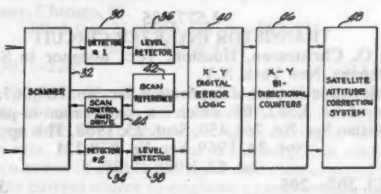
A sterile, pyrogen free, self-contained closed radionuclide generator system in which the eluant for extracting the daughter from the generator column, containing the parent and daughter on a supporting substrate, is prepackaged and stored in a predetermined amount in a sealed, flexible, collapsible plastic bag. The bag is sealably connected to the generator column by a conduit. The eluant is drawn from the bag through the generator column and is automatically withdrawn from the column and collected as an eluate of the daughter in the eluant by impaling a pierceable wall of a sealed evacuated eluate collecting tube on a cannula which is sealably connected to the generator to thereby apply a vacuum to the eluant in the bag to draw it through the generator and cannula into the evacuated eluate collecting tube.

3,576,999

METHOD AND APPARATUS FOR DETERMINING THE ORIENTATION OF AN OBJECT RELATIVE TO AN ELLIPTIC OBJECT

Richard Blythe; Gerald C. Scott; Edgar A. Work, Jr.; Donald S. Lowe, and Philip G. Hasell, Jr., Ann Arbor, Mich., assignors to The Bendix Corporation

Filed Jan. 16, 1965, Ser. No. 609,520
Int. Cl. G01j *1/20*
U.S. Cl. 250—203 **14 Claims**



Method and apparatus for maintaining the orientation of an object, such as a satellite or spacecraft, with respect to a primary object, such as the earth, by sensing points of interception of the primary object's horizon with two scan lines and correlating the sensed information.

ERRATUM

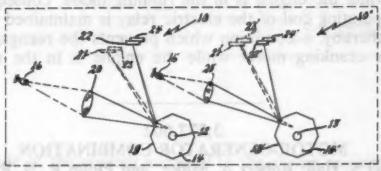
For Class 250—113 see:
Patent No. 3,577,205

3,577,000

SYNCHRORESOLVER WITH OPTICAL FEEDBACK LOOP

David A. Warner, Cambridge, Mass., assignor to the United States of America as represented by the Secretary of the Air Force.

Filed Aug. 21, 1969, Ser. No. 851,981
Int. Cl. G01d *5/30, 5/34*
U.S. Cl. 250—230 **13 Claims**



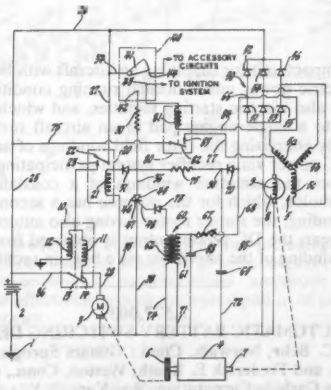
A synchroresolver having a reflective means, a radiant source, a lens and a pair of energy sensors for determining the angular displacement of a rotating body. The reflective means may constitute a reflective prism, a plurality of convex cylindrical reflectors, or the combination of both. The radiant source reflects its radiant energy off the reflective means and onto the pair of energy sensors. The voltage output of the energy sensors is then utilized in making the desired angular determinations.

3,577,001

ELECTRIC CRANKING MOTOR AUTOMATIC DISCONNECT AND LOCKOUT CIRCUIT

Donald L. Cummins, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

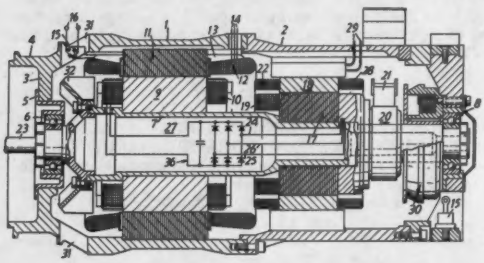
Filed Oct. 31, 1969, Ser. No. 872,939
Int. Cl. F02n *11/08*
U.S. Cl. 290—38 **2 Claims**



An electric cranking motor automatic disconnect and lockout circuit. The normally open contacts of an electric-cranking-motor-solenoid-operated switch, having the operating coil thereof connected across a source of DC potential through the normally open contacts of an electric relay, are connected in series with the electric cranking motor across the source of DC potential. Upon the closure of an electric

switch, an energizing circuit is established for the operating coil of the electric relay across the source of DC potential to close the associated normally open contacts thereof which establish an energizing circuit for the operating coil of the solenoid operated switch. At least a portion of the output potential of an electric generator driven by the cranked engine is transformer coupled across the gate-cathode electrodes of a silicon controlled rectifier, the anode-cathode electrodes of which are connected in parallel with the operating coil of the electric relay. When the generator output potential is of sufficient magnitude to produce gate-cathode current through the silicon controlled rectifier, the resulting anode-cathode current flow therethrough short circuits or shunts sufficient current around the operating coil of the electric relay to substantially deenergize and disenable the operating coil, consequently, the associated normally open contacts open to interrupt the energizing circuit for the operating coil of the cranking-motor-solenoid-operated switch. The silicon-controlled rectifier is maintained conductive while the engine is in the running mode, consequently, the operating coil of the electric relay is maintained disenabled thereby, a condition which prevents the reengagement of the cranking motor while the engine is in the running mode.

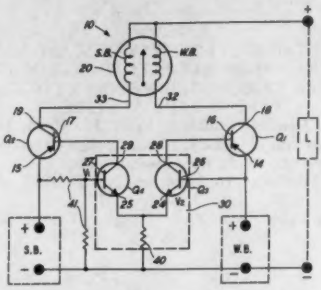
3,577,002
MOTOR-GENERATOR COMBINATION
Samuel S. Hall; Robert A. Miller, and Philip R. H. Riley, Ilford, Essex, England, assignors to The Plessey Company Limited, Ilford, England
Filed Apr. 16, 1969, Ser. No. 816,710
Claims priority, application Great Britain, Apr. 19, 1968, 18692/68
Int. Cl. F02n *11/04*
U.S. Cl. 290—46 **7 Claims**



A compact unit for supplying an aircraft with both DC and AC electric power under normal running conditions and to provide also electric starting facilities, and which can be attached to a single engine pad of an aircraft turbine, is obtained by energizing the rotor field windings of an alternator with DC power via a rectifier system participating in its rotation from the armature windings of a coaxially arranged starter motor, which for the purpose has a second multiturn field winding, the starter motor having also automatic brush-lifting gear; the DC power output is obtained from a second stator winding of the alternator via a built-in rectifier set.

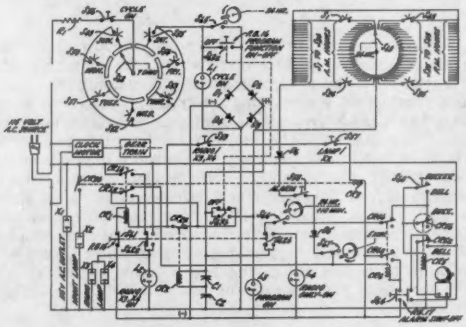
3,577,003
AUTOMATIC BATTERY-SWITCHING DEVICE
Byron C. Behr, Norwalk, Conn.; Gunars Sprogis, Cleveland, Ohio, and Frederick E. Booth, Weston, Conn., assignors to Union Carbide Corporation, New York, N.Y.
Filed Mar. 11, 1969, Ser. No. 806,215
Int. Cl. H02j *7/00*
U.S. Cl. 307—66 **3 Claims**

An apparatus for automatically switching off a working battery and switching on a standby battery when the working battery falls below a predetermined working voltage. The device utilizes at least one switching element such as a transistor associated with the working battery and at least one switching element such as a transistor associated with the standby battery, with the transistor associated with the working battery being connected so as to back bias the transistor



associated with the standby battery. When the working battery wears down to a predetermined voltage its back bias is reduced to a sufficient point so as to turn on the standby transistor and thereby switch on the standby battery.

3,577,004
PROGRAMMED TIMER
Demetrios T. Tsoutsas, Berwyn, Ill. (315 W. Stimpson, Linden, New Jersey, 07036)
Filed Sept. 23, 1968, Ser. No. 784,971
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **8 Claims**

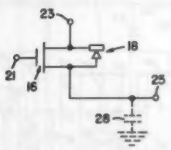


A programmed clock timer is described in which operation of an alarm and an appliance on an adjustable 24 hour sequence is supplemented with selectively programmed 24 hour and 7-day timing sequences whereby one or more appliances may be operated according to a predetermined program consisting of programmed time interval sequences. The program is visibly presented on a control panel with individual incremental time segments being programmed by an array of manually operated push-pull switches. A manual override feature separately controls a selected appliance.

3,577,005
TRANSISTOR INVERTER CIRCUIT
Alton O. Christensen, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Continuation-in-part of application Ser. No. 787,067, , now Patent No. 3,502,908, which is a continuation-in-part of application Ser. No. 761,450, Sept. 23, 1968. This application Nov. 24, 1969, Ser. No. 879,221
Int. Cl. H03k *19/08*
U.S. Cl. 307—205 **3 Claims**

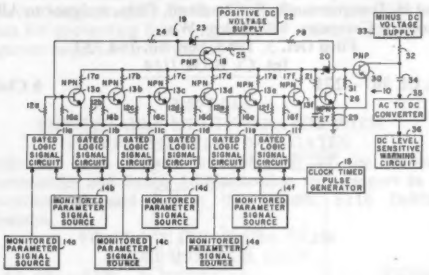
A ratioless MOSFET inverter for capacitive outputs consists basically of a pair of MOSFET's with their sources and drains tied together. The clock input is applied to the com-

mon drain connection and to the gate of one of the MOSFET's and the output is connected to the common source connection. In an alternative construction, the MOSFET whose gate is connected to the clock is replaced by



a Schottky diode connected between the source and drain terminals of the data input MOSFET. The clock is connected to the drain terminal of the data input MOSFET, and the output is connected to the source of the data input MOSFET.

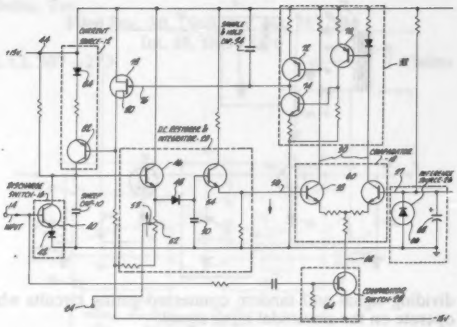
3,577,006
FAIL-SAFE PULSED LOGIC AND GATE
Leo A. Tyrrell, Marion; Daniel E. Castleberry, Cedar Rapids, and Charles A. Weber, Marion, Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa
Filed Mar. 10, 1969, Ser. No. 805,497
Int. Cl. H03k *19/08, 19/22*
U.S. Cl. 307—218 **3 Claims**



A DC logic handling fail-safe pulsed logic AND gate circuit capable of warning the user whenever substantially any single catastrophic component failure occurs inhibiting any of the functions a DC logic circuit is required to perform. It is a multiple input AND gate circuit with the inputs repeatedly pulsed to develop a resulting pulsed output when no input signals are inhibited and there are no circuit disorders within the gate circuit. Biasing circuits within the gate circuit are so subject to bias voltage variation with a signal input inhibit or internal circuit disorder as to inhibit the pulse signal output and thereby warn.

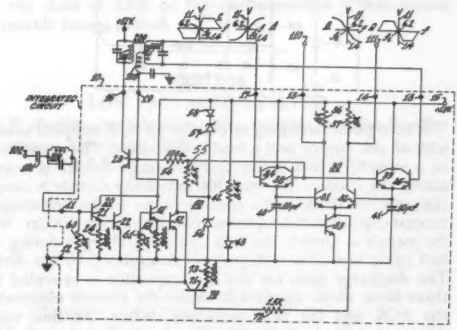
3,577,007
CONSTANT AMPLITUDE VARIABLE FREQUENCY SWEEP GENERATOR
Anthony L. Cross, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Filed Jan. 21, 1969, Ser. No. 792,371
Int. Cl. H03k *4/08*
U.S. Cl. 307—228 **9 Claims**

A sweep generator for an oscilloscope or the like is described for providing a sawtooth output voltage in synchronism with a periodic input signal having a variable repetition rate. A sweep capacitor is discharged in response to the occurrence of each input signal and then charged by a controllable current source to establish a ramp voltage across the capacitor with a selected slope. The voltage across the capacitor is compared with a reference voltage by means of a comparator circuit during a brief time interval at the end of each charging cycle. The comparator circuit controls the



magnitude of the current supplied to the sweep capacitor to maintain the peak output voltage substantially constant.

3,577,008
AUTOMATIC FREQUENCY CONTROL APPARATUS
Jack Craft, Somerville, N.J., assignor to RCA Corporation
Filed Jan. 22, 1969, Ser. No. 792,983
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 **6 Claims**

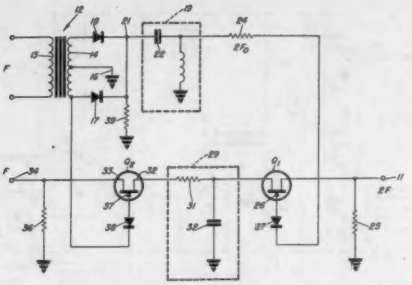


Automatic frequency control apparatus including a differential amplifier-detector biased so as to be responsive only to signals exceeding a predetermined amplitude value established to effectively reduce undesired pull-in of adjacent signal frequencies.

3,577,009
QUADRATURE REJECTION AND FREQUENCY CONVERSION CIRCUIT
Laurence C. Hofmeister, Fort Lauderdale, Fla., assignor to The Bendix Corporation
Filed Feb. 17, 1969, Ser. No. 799,772
Int. Cl. H03b *3/04*
U.S. Cl. 307—233 **10 Claims**

A circuit for eliminating quadrature components from a sinusoidal input signal is described. The circuit also divides

the frequency of the input signal and converts it into a square wave. Conversion of the input is achieved by the use of a



dividing signal and tandem connected gating circuits which operate on the sinusoidal input signal.

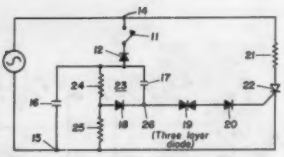
ERRATUM

For Class 307—240 see:
Patent No. 3,577,206

3,577,010
ZERO POINT SWITCHING CIRCUIT FOR TURN-ON OF GATE-CONTROLLED CONDUCTING DEVICES

Edward N. Freyling, Jr., and Robert E. Gregson, Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 31, 1969, Ser. No. 795,577
Int. Cl. H03k 17/00
U.S. Cl. 307—252 9 Claims



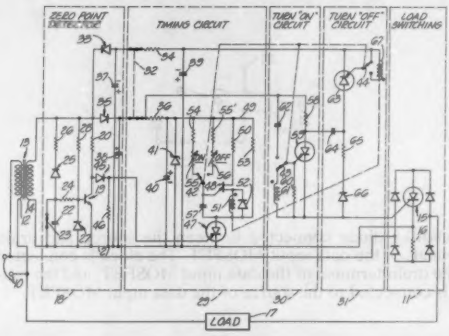
A zero point switching circuit for an SCR coupled in series with an AC source and a load is described. The combination of a switch, a first diode and a voltage divider is coupled across the source. The variable tap of the divider is coupled via a second diode and a first capacitor to the first diode. A second capacitor is coupled across the voltage divider. When the switch is closed, the first capacitor charges during one-half cycle toward a voltage level determined by the divider. The discharge path for the first capacitor is provided by a three-layer diode coupled between the control electrode of the SCR and the first capacitor. When the line voltage decreases prior to the next half cycle, the first capacitor voltage exceeds the threshold voltage of the three-layer diode whereby this capacitor discharges through the SCR into the second capacitor. The second capacitor charges to a voltage sufficient to render the three-layer diode nonconductive and then discharges through the voltage divider to permit the first capacitor to again discharge into the gate of the SCR. As a result, the first capacitor repetitively discharges into the gate of the SCR with large current spikes at or just prior to the zero point of the line voltage.

3,577,011
TEST CIRCUIT

Joseph Gino Raffaelli, Granda Hills, and Hendricus Johnnes Lokkart, Arleta, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 13, 1968, Ser. No. 736,686
Int. Cl. H03k 17/00
U.S. Cl. 307—252C 2 Claims

There is disclosed a circuit including a gate-controlled switch for gating alternating current to a load. A timing circuit is employed to turn the switch on or off at a predetermined time after the line voltage reaches zero. The device of the invention is especially useful as a test circuit for applying

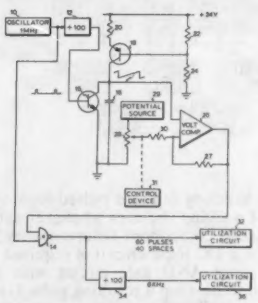


a voltage or interrupting a current to a load at a predetermined time during the cycle of the line voltage. A zero point detector having a manually operable switch is employed to actuate the timing circuit.

3,577,012
CIRCUIT FOR CONTROLLING FREQUENCY WITH VOLTAGE

Ernst H. Dummermuth, E. Cleveland, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 3, 1968, Ser. No. 764,732
Int. Cl. H03k 1/14
U.S. Cl. 307—271 6 Claims



A circuit for providing output pulses at a frequency determined by a variable DC control voltage. The circuit includes a gate to which an oscillator output is applied. The gate is controlled by the output of a comparator circuit which compares the amplitude of a ramp signal with the DC control voltage. The ramp signal is generated at a frequency which is a subharmonic of the oscillator frequency. The gate passes the oscillator output pulses as long as the ramp signal amplitude is less than the DC control voltage.

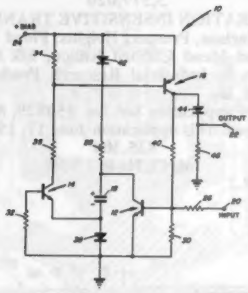
3,577,013
LOW STANDBY POWER MONOSTABLE MULTIVIBRATOR HAVING NONCRITICAL CUTOFF

Eric J. Hoffman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy.

Filed Sept. 6, 1968, Ser. No. 757,872
Int. Cl. H03k 3/26
U.S. Cl. 307—273 12 Claims

A monostable multivibrator circuit, or one-shot, which consumes virtually no power while in its standby state and

having noncritical cutoff. Under quiescent conditions all circuit transistors are nonconductive and a circuit capacitor is fully charged. An input signal causes a first transistor to become conductive and thereby causes the capacitor to discharge exponentially from a negative potential toward a positive potential. The discharge time associated with the



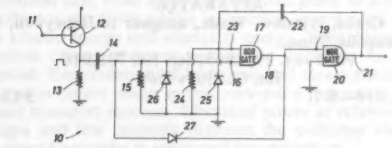
capacitor determines the on-time of the instant one-shot. Second and third transistors are connected into the circuit in such a manner that the circuit regeneratively turns on and degeneratively turns off. Further, the circuit is provided with means for preventing false triggering by voltage spikes from the power supply or from the load.

3,577,014

MONOSTABLE MULTIVIBRATOR WITH COMPLEMENTARY NOR GATES

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert W. O'Neill, 5218 DeMilo, Houston, Tex.

Filed July 8, 1970, Ser. No. 53,156
Int. Cl. H03k *3/26, 18/34*
U.S. Cl. 307—273 **8 Claims**



First and second positive NOR complementary Mos gates are employed to form a monostable multivibrator circuit in which the output of the first gate forms the input to the second gate and the output of the second gate forms the system output. The trigger signal supplied to the gates is differentiated through a resistance-capacitance circuit and supplied to the first gate. The differentiated signal may be bypassed across the first gate through a semiconductor diode to the input of the second gate to permit narrow pulse width outputs to reduce input pulse power and to increase the duty cycle of the circuit. A feedback capacitor connected across both gates is employed in an internal resistance-capacitance circuit to provide the time constant for the multivibrator.

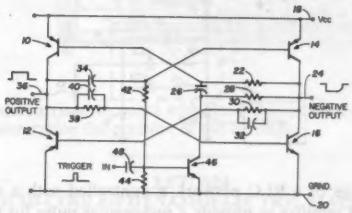
In a modified form, a plurality of monostable multivibrator circuits are employed together to generate a sequence of control pulses in a date processor.

3,577,015

MONOSTABLE MULTIVIBRATOR WITH LOW POWER REQIREMENTS

George W. Niemann, Dallas, and Robert A. Stehlin, Richardson, Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed Dec. 30, 1968, Ser. No. 787,794
Int. Cl. H03k *3/26*
U.S. Cl. 307—273 **7 Claims**



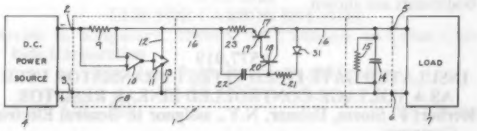
The invention disclosed is a monostable multivibrator circuit having first and second pairs of complementary transistors, with each pair connected collector-to-collector in series. The bases of the first pair of transistors are coupled to a first output terminal at the juncture between collectors of the second pair of transistors. The bases of the second pair of transistors are coupled to a second output terminal at the juncture between the collectors of the first pair of transistors. Terminals are provided for applying electrical power across the first and second pairs of transistors in order to maintain one transistor in each of the transistor pairs in a conductive state. A normally nonconductive trigger transistor is connected to the circuit for receiving a trigger signal in order to vary the state of each of the transistors for a preselected monostable timing period.

3,577,016

LOW PASS ACTIVE FILTER

Hans E. Weidmann, Glendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 12, 1968, Ser. No. 759,339
Int. Cl. H03k *1/14*
U.S. Cl. 307—297 **7 Claims**

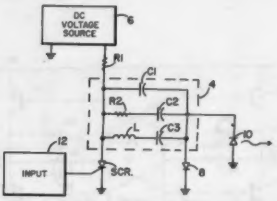


A filter circuit for connection between a direct current power supply and a load which has incorporated in the series line running between the input and output terminals of the filter circuit a network that presents a high impedance to alternating current components that appear at either end of the filter, such network presenting relatively small resistance to direct current load currents that flow through the filter. The network shown has a transister with its emitter and collector elements connected in the filter series line, and the base element of the transistor is connected to (i) a bias resistor that has its opposite end joined through a diode with the transistor collector, and (ii) a smoothing capacitor that has its opposite side joined with the transistor emitter.

3,577,017
RECTANGULAR PULSE MODULATOR

Jimmy R. Duke, and Walter E. Miller, Jr., Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Dec. 17, 1968, Ser. No. 784,443
Int. Cl. H03k 3/35
U.S. Cl. 307—284 2 Claims

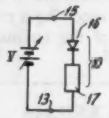


Discharge of a RLC network is controlled with a silicon-controlled rectifier to provide a rectangular pulse for pulsing GaAs lasers.

3,577,018
HIGH-SPEED LOGIC DEVICE EMPLOYING A GUNN-EFFECT ELEMENT AND A SEMICONDUCTOR LASER ELEMENT

Toshio Wada; Yasuo Matsukura, and Kuniichi Ohta, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 13, 1969, Ser. No. 806,830
Claims priority, application Japan, Mar. 15, 1968, 43/17141
Int. Cl. H01l 19/00
U.S. Cl. 307—299 12 Claims

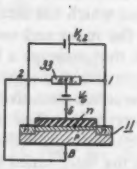


A semiconductor device is described wherein a Gunn effect element is placed in series with the PN junction of a semiconductor laser. A bias potential is applied across the series connection to forwardly bias the PN junction and normally produce lasing action from the laser element. The bias potential is further selected so that current reductions produced by high electric field layers traveling within the Gunn element effectively suppress lasing actions. Several embodiments are shown.

3,577,019
INSULATED GATE FIELD EFFECT TRANSISTOR USED AS A VOLTAGE-CONTROLLED LINEAR RESISTOR

Herbert F. Storm, Delmar, N.Y., assignor to General Electric Company

Filed Sept. 24, 1968, Ser. No. 762,091
Int. Cl. H03k 3/26
U.S. Cl. 307—304 4 Claims

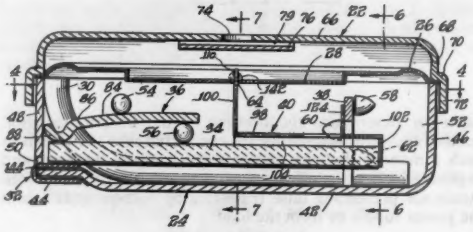


The channel resistance of a metal-oxide-semiconductor field-effect transistor, or other insulated gate field effect transistor, is linearized by applying to the gate electrode, in addition to the gate voltage for controlling the conductivity, an external feedback voltage having a value of one-half the supply voltage to nullify the effect of the internal feedback due to the supply voltage. In some cases the base electrode is disconnected, but spurious effects caused thereby can be avoided. The voltage-controlled linear resistor can be employed in DC and AC circuits in applications such as an AC phase shift circuit.

3,577,020
ACCELERATION INSENSITIVE TRANSDUCER

Elmer Victor Carlson, Prospect Heights; Floyd Warren Cross, Wheaton, and Mead Clifford Killion, Elk Grove Village, Ill., assignors to Industrial Research Products, Inc., Elk Grove Village, Ill.

Continuation of application Ser. No. 550829, May 17, 1966, now abandoned. This application June 17, 1969, Ser. No. 835,304
Int. Cl. H04r 17/00
U.S. Cl. 310—8.2 10 Claims

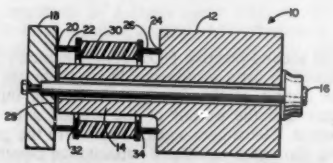


A transducer which includes a conductive case and an apertured cover mounted on the case. A baffle plate is mounted adjacent to the aperture. A diaphragm is mounted on the case. A piezoelectric element is mounted within the case and is held in position by a resilient conductive clip which is stressed beyond its elastic limit. A lever attached to a fixed pivot connects the piezoelectric element with the diaphragm and has balanced effective moments due to inertia on opposite sides of the pivot.

3,577,021
PIEZOELECTRIC TRANSDUCER MOUNTING APPARATUS

Irvin F. Gerks, Winslow, Wash., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 29, 1969, Ser. No. 795,016
Int. Cl. H01v 7/00
U.S. Cl. 310—8.7 3 Claims

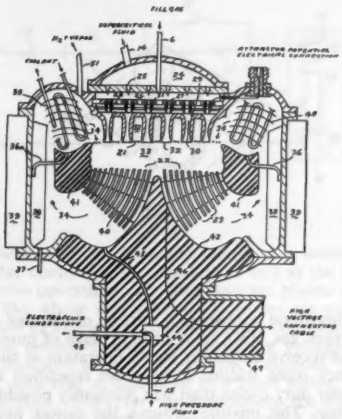


A method of and apparatus for mounting a ceramic transducer to substantially reduce stresses produced therein as a result of its operation or external forces. The improvement comprises cylindrical rings which, while having high axial stiffness, have relatively low radial stiffness and therefore allow the transducer to flex or expand radially with respect to the mounting means while being axially held in place.

3,577,022
THERMOBALLISTIC GENERATOR

Siegfried H. Hasinger, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

Filed Jan. 6, 1970, Ser. No. 001,005
Int. Cl. H02n 3/00
U.S. Cl. 310—10 7 Claims



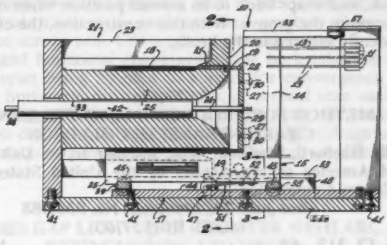
Jets of high energy supercritical steam in a disintegrated state containing a small percentage of conductive colloidal particles are inductively electrically charged, then evaporated, in a fillgas mixture of steam and hydrogen transferring electrical charge to the colloids. After the evaporation the hydrogen and water vapor carrying the charged colloids are accelerated to a supersonic speed in expansion nozzles such that a wet vapor condition occurs and condensation takes place with the charged colloids acting as condensation nuclei. The condensation nuclei are kept from contacting the expansion nozzle walls by a sheath composed of the fillgas. The charged condensation droplets at constant or with slightly increased environmental pressure then traverse a conversion space of suddenly increased cross section of determined size, from a ground potential plane to a plurality of collector electrode plates converting an essential part of their kinetic energy into electrical energy. They deposit their electrical charge thereon raising the collector to a high potential. Recirculation of hydrogen and steam through the conversion region assists in the conversion process as a cooling and transport medium. Electrical power at relatively high voltages and low currents between the collector electrode and ground potential is generated for utilization.

3,577,023
MOVING COIL ACTUATOR

Lewis W. Bleiman, Northridge, Calif., assignor to Advanced Peripherals, Inc., Van Nuys, Calif.

Filed Dec. 4, 1969, Ser. No. 882,108
Int. Cl. H02k 41/02
U.S. Cl. 310—13 15 Claims

A moving-coil actuator having a carriage with an upright supporting post and an elongated undercarriage extending in one direction along a track for supporting the carriage. An electrical coil mounted on one side of the post projects in the same direction as the undercarriage into an annular air gap in a permanent magnet assembly, the undercarriage projecting into the assembly through a slot therein, and a plurality of head-supporting arms project in the opposite direction from the post into a stack of memory discs. Roller bearings adjacent the opposite ends of the undercarriage ride on inclined ways on the track, and a holddown bearing assembly is spring urged upwardly to ride along overlying ways. One element of an optical position-determining device is rigidly mounted on

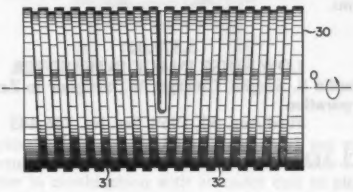


the undercarriage to coact with fixed elements on the actuator to determine the position of the carriage.

3,577,024
LIQUID-COOLED DYNAMOELECTRIC MACHINES

Junpei Inagaki; Moriyoshi Sakamoto, Yokohama-shi; Tsuneo Nakaita, Kawasaki-shi, and Hiroyuki Kitamura, Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 29, 1969, Ser. No. 861,602
Claims priority, application Japan, Oct. 1, 1968, 43/70872
Int. Cl. H02k 9/19
U.S. Cl. 310—54 1 Claim

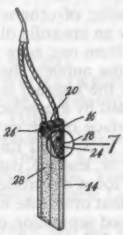


In a liquid-cooled dynamoelectric machine comprising a stator, a rotor, and means to spray cooling liquid directly upon heated portions of the stator, the peripheral surface of the rotor is provided with a pair of oppositely directed helical grooves or a pair of oppositely inclined surfaces to create components of force which act to prevent the cooling liquid from entering into the airgap between the stator and the rotor.

3,577,025
CLIP FOR CARBON BRUSHES

Archie R. Kingsbury, Taylors, S.C., assignor to Union Carbide Corporation

Filed June 7, 1968, Ser. No. 735,348
Int. Cl. H02k 13/00
U.S. Cl. 310—239 11 Claims



A clip for use with carbon brushes to form an assembly suitable to operate in electric equipment, the clip having at

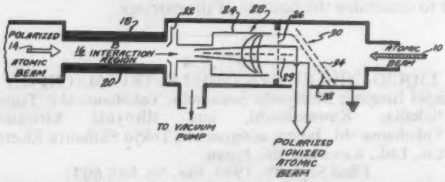
least two members, one of the members being provided with a resilient protruding segment. This segment moves to a position flush with the surface of the member to which it is secured while the clip is sliding into a groove in the carbon brush, and snaps back to its normal position when it engages a recess in the groove. With the construction, the clip is permanently secured to the brush.

3,577,026

METHOD FOR PRODUCING IONS UTILIZING A CHARGE-TRANSFER COLLISION

Willy Haeberli, Madison, Wis., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed June 24, 1969, Ser. No. 836,088
Int. Cl. H01j *27/00*
U.S. Cl. 313—63 **12 Claims**



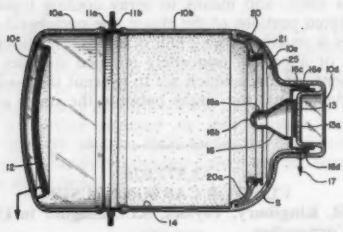
Ionization of a first beam of polarized neutral atoms is accomplished by a charge-transfer collision with a second beam of atoms.

3,577,027

LOW NOISE IMAGE INTENSIFIER

Constantin S. Szegho, Chicago, Ill., assignor to Zenith Radio Corporation

Filed Aug. 30, 1968, Ser. No. 756,443
Int. Cl. H01j *39/00, 1/52*
U.S. Cl. 313—101 **8 Claims**



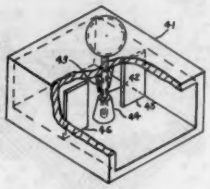
An image intensifier of otherwise conventional construction is improved by an inwardly directed extension of the envelope, projecting from one edge of the focus electrode and extending toward the anode. The focus electrode is a conductive coating on the internal surface of the envelope and is, in effect, extended by a conductive coating applied to the inwardly facing surface of the envelope extension. That extension terminates in a metal ring. With the structure, the surface separation or leakage path between the metal ring termination of the focus electrode and the anode is substantially greater than that otherwise existing between those electrodes. The increased separation of these electrode elements along the surface of the envelope minimizes the tendency toward field emission and its contribution to background noise. A high resistance coating or an electron shield protects the shoulder of the envelope from electron bombardment and eliminates that source of background noise.

3,577,028

CHLORINE-OXYGEN TRANSMIT-RECEIVED STAGE TO OPERATE AT SHORT PULSE WIDTHS, LOW PULSE REPETITION FREQUENCIES, AND WIDE DUTY CYCLES

Harry Goldie, Randallstown, Md., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Sept. 30, 1969, Ser. No. 862,203
Int. Cl. H01j *17/20*
U.S. Cl. 313—223 **1 Claim**



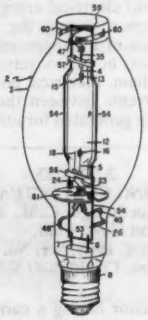
The invention consists of a mixture of chlorine gas, (Cl_2), and oxygen gas, (O_2), to be used in place of pure Cl_2 gas in transmit-receive stages for stable operation at shorter radio frequency pulse widths, lower pulse repetition frequencies and wider duty cycles than was previously possible with Cl_2 gas alone. The mixture reduces the power necessary for ionization of the gas in the stage which decreases the random amplitude modulation on the leakage envelope and reduces the total spike energy output to the receiver making it possible to use more sensitive receivers without danger of their being damaged by spike leakage. The invention also provides a much faster recovery time than is possible with a mixture of Cl_2 gas and noble gas which yields the same leakage as that of the invention.

3,577,029

HIGH-PRESSURE ELECTRIC DISCHARGE DEVICE CONTAINING MERCURY, HALOGEN, SCANDIUM AND SAMARIUM

Frederic Koury, Lexington, and John F. Waymouth, Marblehead, Mass., assignors to Sylvania Electric Products, Inc.

Filed Nov. 29, 1968, Ser. No. 780,117
Int. Cl. H01j *61/18*
U.S. Cl. 313—229 **6 Claims**

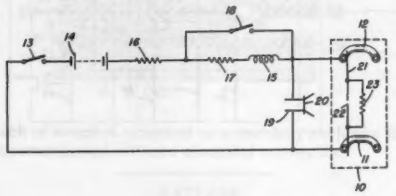


A metal arc lamp, which emits all visible colors in the spectrum and has good red rendition, contains a fill including mercury, halogen, scandium and samarium. The lamp is an efficient producer of white light.

3,577,030
INDUCTIVE ENERGIZING CIRCUIT FOR ARC PLASMA GENERATOR

Richard T. Cusick, Laurel, and Edgar A. Bunt, Kensington, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 30, 1967, Ser. No. 678,973
Int. Cl. H01j *7/24*
U.S. Cl. 315—111 **6 Claims**

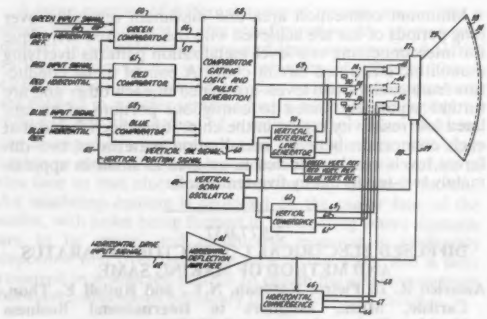


The present invention generally relates to a method and apparatus for controlling the running, as well as the starting and shut-down operations, of a shutdown arc plasma generator or the like whose spaced-apart electrodes are energized from a circuit including an inductor which is connected in series with the electrodes and their energizing voltage source and which functions to damp out current pulsations, particularly those occurring at high mass flow rates within the arc plasma generator. Moreover, by maintaining the electrode arc discharge current constant, the arc rotation rate is also more uniform. Due to the fact that the series inductor causes current buildup in the electrode energizing circuit to be a function of time, suitable means are provided for delaying the establishment of the electrode arc discharge until such time as the circuit current has been built up sufficiently to insure that the arc discharge will be sustained. Moreover, means are also provided for decoupling the inductor from the remainder of the electrode energizing circuit, prior to the time when the electrode energizing circuit is open-circuited, so as to prevent arcing at the switch or circuit breaker means utilized to open the electrode energizing circuit.

3,577,031
MULTICOLOR OSCILLOSCOPE

Neil R. Welsh, and Richard E. McCormick, Dana Point, Calif., assignors to Telonic Industries, Inc., Laguna Beach, Calif.

Filed July 7, 1969, Ser. No. 839,240
Int. Cl. H01j *29/50, 29/52, 29/72*
U.S. Cl. 315—13 **23 Claims**

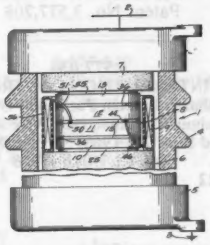


An oscilloscope employing a multibeam, multicolor cathode-ray tube in which each of several input signals are displayed in a different color on the cathode-ray tube screen. The electron beams are rapidly scanned along the vertical axis to produce a vertical raster. Plural horizontal reference lines are displayed in discrete colors simultaneously with the signal traces by displaying the reference lines and input signals as colored dots by individually intensity modulating the plural electron beams during their alternate up and down scans. Plural vertical reference lines are displayed in discrete colors simultaneously with the signal traces and the horizontal reference lines by energizing each of the beams for a single vertical trace at a predetermined position along the horizontal screen axis. Convergence circuits correct for both vertical and horizontal convergence, the horizontal convergence circuit being adapted to correct for convergence for differing horizontal drive waveforms. A vertical scan oscillator including a resonant circuit incorporating the vertical deflection coil provides a high frequency, high voltage scan without requiring large voltages across the amplification stage.

3,577,032
SERIES GAP LIGHTNING ARRESTER WITH ARC EXTINGUISHING CHAMBERS

Darrel D. McStrack, New Berlin, and Lawrence M. Barrage, South Milwaukee, Wis., assignors to McGraw-Edison Company, Milwaukee, Wis.

Filed Nov. 22, 1968, Ser. No. 778,060
Int. Cl. H01t *1/04, 5/02;* **H02h** *1/04*
U.S. Cl. 315—36 **25 Claims**



This disclosure relates to an overvoltage spark gap protective apparatus having a series of arc gaps each within a spark gap chamber in combination with an outer coil to elongate the arcs. Each chamber houses a pair of spaced electrodes disposed nonsymmetrically therein to define an arc extension or elongating chamber to the one side of the electrodes. The walls of the confining chamber are formed of a semiconductor with a rough surface and are contoured to define a decreasing cross section with terminates in a narrow sidewall in the outer edge of the arc-elongating chamber. The outer end portion of the confining chamber, and particularly at the narrow sidewall, is connected by suitable vent passageway means to the exterior of the apparatus. The electrodes are mounted within an arcuate wall and secured thereto by an anchor lug along which the arc root moves from the electrode. A single wire magnetic coil is wound concentrically about the spark gap chamber and is connected in series with the protective arc gap electrodes. The coil serves to elongate the arc into the confining chamber and outwardly to the narrow sidewall.

ERRATUM

For Class 315—39 see:
Patent No. 3,577,207

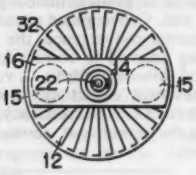
3,577,033
MAGNETRON DEVICE WITH COOLING FLUID FLOW IN LONGITUDINAL DIRECTION OF MAGNETRON TUBE

Ichiro Aoki; Kenji Iwasaki, Yokohama-shi; Tamaji Yoshihashi, Fukaya-shi; Tokuju Koinuma, Kawasaki-shi; Masao Kato, and Akihiro Fukatu, Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Mar. 13, 1969, Ser. No. 806,975
Claims priority, application Japan, Mar. 18, 1968, Nov. 20, 1968, 43/20768;43/100759
Int. Cl. H01j *7/26, 25/50*
U.S. Cl. 315—39.71 **5 Claims**

In a magnetron device including a magnetron tube and a

permanent magnet, cooling means is provided for cooling the magnetron tube and magnet, the cooling means defining



cooling fluid flow paths in a direction substantially in parallel with the longitudinal axis of the magnetron tube.

ERRATUM

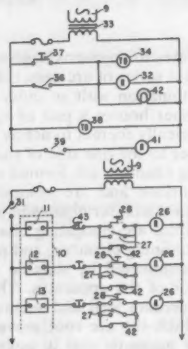
For Class 317—2 see:
Patent No. 3,577,208

3,577,034

POWER INTERRUPTION CONTROL SYSTEM

George D. Bernhard, Lincoln Park, and Olek Schwarz, Plainfield, N.J., assignors to Anaconda Wire and Cable Company

Filed Sept. 29, 1969, Ser. No. 861,882
Int. Cl. H01h *47/18*
U.S. Cl. 317—22 4 Claims



Where a plurality of processing operations are powered from a common electrical supply, shutdown of the operations by momentary interruptions of power is prevented by timing a main circuit relay not to open unless the interruption has a preselected time duration, shorting individual switches that have opened due to the interruptions, and breaking such shorts soon after the power has resumed.

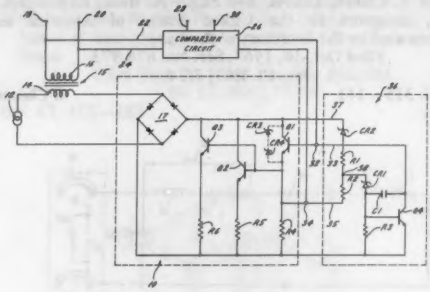
3,577,035

POWER TRANSISTOR PROTECTION CIRCUIT

James M. Constable, Flushing, N.Y., assignor to Del Electronics Corp., Mount Vernon, N.Y.

Filed June 11, 1968, Ser. No. 736,231
Int. Cl. H02h *3/08, 3/20*
U.S. Cl. 317—31 12 Claims

A protection circuit is operatively connected to a power transistor in a power supply control circuit. Means are provided to derive signals representative of the current flow through the power transistor and to the voltage across that transistor, and to sum those signals. At excessive, unsafe current and voltage levels in the power transistor, that sum will



exceed a predetermined value, and will be effective to decrease the current flowing through the power transistor.

ERRATUM

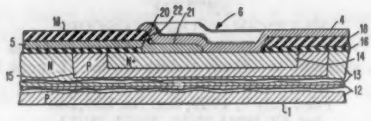
For Class 317—98 see:
Patent No. 3,577,209

3,577,036

METHOD AND MEANS FOR INTERCONNECTING CONDUCTORS ON DIFFERENT METALIZATION PATTERN LEVELS ON MONOLITHICALLY FABRICATED INTEGRATED CIRCUIT CHIPS BY ALLOYING AN INTERCONNECTION PORTION OF EACH CONDUCTOR TO CONTIGUOUS PORTIONS OF ONE LOW RESISTIVITY REGION OF THE CHIP

John J. Curtis, Endwell, N.Y., and Carl E. Ruoff, Boston, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1969, Ser. No. 821,592
Int. Cl. H01l *19/00*
U.S. Cl. 317—101 8 Claims



Minimum connection area and maximum reliability over long periods of use are achieved with the improved technique for interconnecting two-level metalization patterns overlying monolithic integrated circuit chips. A pair of metal conductors from each of two levels are joined to each other and are further separately joined to contiguous portions of an isolated low resistivity region in the chip. It has been found that each connection between metalization patterns of two different levels can be effected in an area as small as approximately two-tenths mil by five-tenths mil.

3,577,037

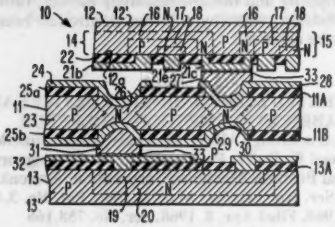
DIFFUSED ELECTRICAL CONNECTOR APPARATUS AND METHOD OF MAKING SAME

Americo R. Di Pietro, Katonah, N.Y., and Rudolf E. Thun, Carlisle, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 5, 1968, Ser. No. 742,886
Int. Cl. H01l *19/00*
U.S. Cl. 317—101 1 Claim

An electrical connector having first and second metallization conductive patterns disposed on two faces, respectively, of a semiconductor substrate and one or more diffused interconnections within the substrate for connecting the conductive patterns in a predetermined manner. Circuit apparatus

having at least two semiconductor substrates, each of which has a plurality of integrated circuits of the monolithic type,



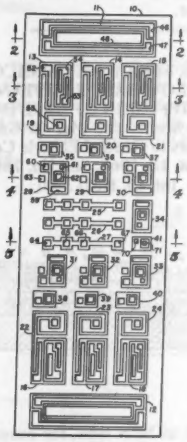
and each of which is mounted on a mutually exclusive face of the aforementioned diffused electrical connector.

3,577,038

SEMICONDUCTOR DEVICES

Charles R. Cook, Jr., North Palm Beach, Fla., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 595,532, Nov. 18, abandoned, which is a continuation of Ser. No. 221,409, Aug. 31, 1962, abandoned.
Sept. 4, 1968, Ser. No. 757,438
Int. Cl. H011 *I9/00*
U.S. Cl. 317—101 **9 Claims**



A large number of different types of circuits made from a single semiconductor wafer configuration by varying the manner in which connections and leads are provided to the various regions of the wafer. A plurality of different circuit elements such as transistors, diodes, resistors and capacitors, are formed in a wafer semiconductor material, preferably by diffusion into the surface of a major wafer. These elements are arranged in a pattern adjacent the major face, with each region or electrode of each element coming to the surface at this face so that electrical connection may be made thereto. An insulating coating is provided on the major face of the wafer, with holes being formed in the coating where contacts are to be made, and conductive material is preferably deposited first over the entire face of the wafer and is later removed in a selected pattern to create the interconnections between components necessary for the selected circuit.

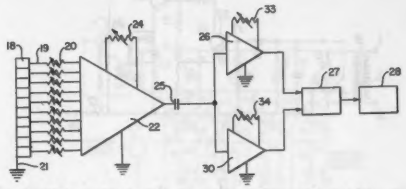
3,577,039

OPTICAL APPARATUS FOR FLAW DETECTION

Norman R. Sanford, Dayton, Ohio, and Heinrich J. Wieg, New Burlington, Ohio, assignors to The Bendix Corporation

Filed Jan. 28, 1969, Ser. No. 794,526
Int. Cl. H01h *47/24*
U.S. Cl. 317—127 **7 Claims**

There is disclosed an optical apparatus for flaw detection in which a traveling line of light is reflected from the surface of an object to an array of photocells. The outputs of the photocells are combined in a summing amplifier and changes in the output of the summing amplifier exceeding some predetermined amount above or below a normal value are



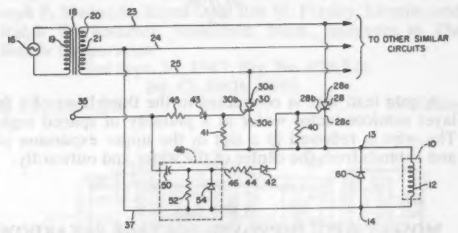
used as a control or reject signal. Each of the individual photocells is compensated so that the same relative amount of change in the cell's light input produces the same amount of change in the signal seen at the output of the summing amplifier.

3,577,040

SOLENOID CONTROL CIRCUIT

Richard H. Campbell, Jr., Gilford, N.H., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Sept. 26, 1968, Ser. No. 762,723
Int. Cl. H02m *7/44;* **H01h** *47/32*
U.S. Cl. 317—148.5 **3 Claims**



An electronic circuit for actuating a solenoid load from an AC power source in a two-step sequence wherein a high DC voltage is initially applied to "pull-in" the solenoid armature and a lower voltage maintains the armature in a "hold" condition. Silicon-controlled rectifiers (SCR's) provide an electronic switching and rectification of the voltage for operating power. The circuit is controlled by an electrical signal which conditions the SCR's to provide operating voltage during alternate half cycles of the power source and a time delay circuit allows conduction of the "pull-in" SCR for only a few cycles of the power source.

3,577,041

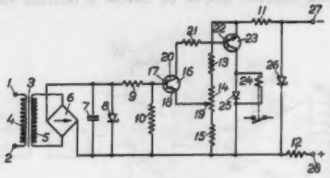
OVERCURRENT RELAY CIRCUIT

Arne Kring, and Arne Johansson, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 10, 1969, Ser. No. 805,758
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 **3 Claims**

An overcurrent relay circuit, the pickup value of which is substantially independent of the DC-component in an asymmetrical alternating current, has an input transformer, the magnetic circuit of which is provided with air gaps while the secondary load of this transformer is high-resistive. To the

secondary winding of the transformer is connected a rectifier with a smoothing device connected to level-sensing circuit



and an output magnetic relay in the output circuit of the level-sensing circuit.

3,577,042

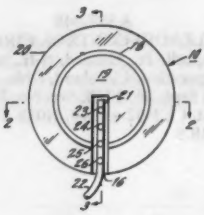
GATE CONNECTION FOR CONTROLLED RECTIFIERS

Thomas J. Roach, Palos Verdes Estates, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Filed June 19, 1967, Ser. No. 647,038

Int. Cl. H01l *1/14, 11/10*

U.S. Cl. 317—235 **6 Claims**



A gate lead wire is connected to the third layer of a four-layer semiconductor wafer at a plurality of spaced regions. The wire is received in a slot in the upper expansion plate and extends from the center of the wafer and outwardly.

3,577,043

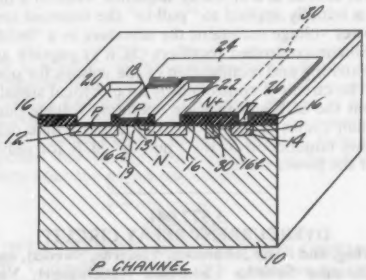
MOSFET WITH IMPROVED VOLTAGE BREAKDOWN CHARACTERISTICS

Robert C. Cook, Worcester Township, Pa., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 7, 1967, Ser. No. 688,766

Int. Cl. H01l *11/14, 19/00*

U.S. Cl. 317—235R **1 Claim**



A low resistivity impurity barrier prevents inversion layer conduction between a MOSFET protection diode and the source (or drain). Adjusting the spacing and impurity gradient between the impurity barrier and the protection diode results in control over reverse bias breakdown between the diode impurity and the low resistivity barrier, rather than with the substrate, whereby a lower, controlled breakdown voltage may be achieved.

3,577,044

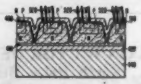
INTEGRATED SEMICONDUCTOR DEVICES AND FABRICATION METHODS THEREFOR

William J. Armstrong; Albert M. Healy, Essex Junction, Vt., and Michael C. Duffy, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 532,754, Mar. 8, 1966, Pat. No. 3,476,224, Dec. 17, 1968. Filed Apr. 8, 1968, Ser. No. 758,166

Int. Cl. H01l *19/00*

U.S. Cl. 317—235 **6 Claims**



This invention is directed generally to integrated semiconductor devices including fabrication methods therefor and, more particularly, to insulator encapsulated, dielectrically isolated, integrated semiconductor devices including fabrication methods therefor.

3,577,045

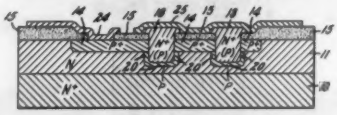
HIGH EMITTER EFFICIENCY SIMICONDUCTOR DEVICE WITH LOW BASE RESISTANCE AND BY SELECTIVE DIFFUSION OF BASE IMPURITIES

William E. Engeler, Scotia, and Marvin Garfinkel, Schenectady, N.Y., assignors to General Electric Company

Filed Sept. 18, 1968, Ser. No. 760,526

Int. Cl. H01l *3/00*

U.S. Cl. 317—235 **14 Claims**



A transistor, such as NPN type, for example, is fabricated by first diffusing a heavily doped P-type base contact region into an N-type semiconductor layer epitaxially grown on a heavily doped N-type semiconductor wafer. Holes are etched through the base contact region into the N-type layer and strongly N-type semiconductor material containing both N-type impurities and faster diffusing P-type impurities is epitaxially grown so as to fill the holes. The wafer is then heated to diffuse the P-type impurities so as to form a base region of controlled thickness, simultaneously forming emitter-base and base-collector junctions. Emitter contact is made by contacting the material epitaxially grown in the holes. Other type semiconductor devices, such as semiconductor controlled rectifiers, may also be fabricated in this manner.

3,577,046

MONOLITHIC COMPOUND THYRISTOR WITH A PILOT PORTION HAVING A METALLIC ELECTRODE WITH FINGER PORTIONS FORMED THEREON

Joseph Moyson, Union Springs, N.Y., assignor to General Electric Company

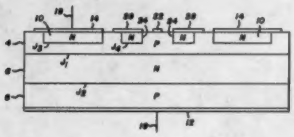
Continuation-in-part of application Ser. No. 741,675, July 1, 1968, now abandoned. This application Mar. 21, 1969, Ser. No. 809,076

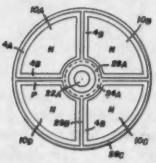
Int. Cl. H01l *11/00, 15/00*

U.S. Cl. 317—235R **3 Claims**

A silicon-controlled rectifier or thyristor is provided having a control signal responsive pilot portion functionally

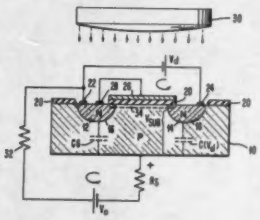
separated from, though structurally monolithic with, a main current carrying portion. Turning on of the pilot portion is controlled by a gate or control signal and the resulting pilot current through the pilot portion provides a high energy turn-on signal for the main portion, thereby enabling optimum





turn-on efficiency to be designed into the pilot portion while preserving high current carrying capacity in the main portion, with resulting high *di/dt* and *dv/dt*. The turn-on signal from the pilot thyristor may be distributed over a wide area of the main thyristor.

3,577,047
FIELD EFFECT DEVICE
George Cheroff, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 15, 1969, Ser. No. 791,254
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 **5 Claims**



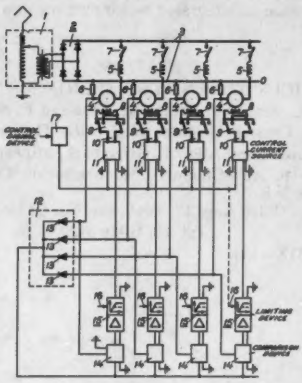
A field-effect device is provided which comprises a field effect transistor of the insulated gate type. The device is capable of being used as a photodetector with a gain greater than unity. To this end, the transistor is biased in the "off" state by a substrate potential (source-to-substrate) resulting from the provision of an external voltage supply in the source-to-substrate loop. Upon the radiation of the source and drain junctions in the transistor, a current is caused to flow between the source and drain electrodes which result in a current gain in excess of unity.

ERRATUM

For Class 317—235 see:
Patent No. 3,577,210

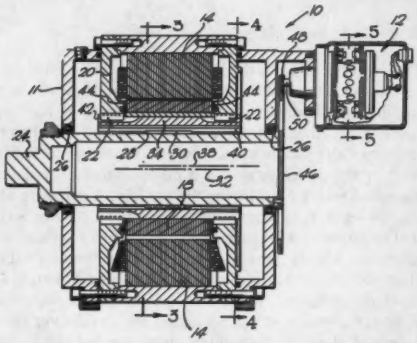
3,577,048
PLURAL MOTOR ANTISLIP DRIVE CONTROL
Tore Nordin, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Dec. 26, 1968, Ser. No. 787,182
Claims priority, application Sweden, Dec. 27, 1967, 17793/67
Int. Cl. B61c *15/08*
U.S. Cl. 318—52 **2 Claims**

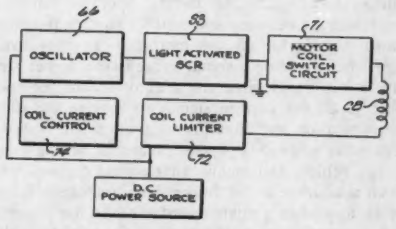
A driving system for an electric locomotive has a plurality of parallel-connected direct current motors each connected to a pair of wheels and connected by their armature windings to a variable alternating current source by a rectifier. Each motor has a field winding connected to a control current source to receive signals from the source to reduce the field. Each armature circuit feeds to a selection device a mag-



nitude proportional to the armature current. The selection device selects the greatest of these magnitudes, which is compared with each of the magnitudes proportional to the armature current, which signal is then fed to the field winding. The control signal is maintained below a certain maximum value.

3,577,049
SELF-COMMUTATED ELECTROMOTIVE DEVICE
Joseph P. Madurski, Royal Oak; Rex W. Presley, Livonia, and Ralph W. Rothfusz, Southfield, Mich., assignors to The Bendix Corporation
Filed Sept. 26, 1967, Ser. No. 670,726
Int. Cl. H02k *29/00*
U.S. Cl. 318—138 **15 Claims**





An electromotive device including a stator provided with electromagnets, an eccentric armature mounted for move-

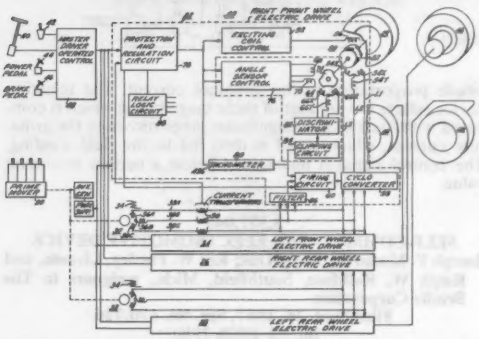
ment by the electromagnets, and an output member which is concentric with the stator and is driven by the armature movement. A light-actuated electromagnet commutation system is disclosed. The armature of the electromotive device has epicyclic movement relative to both the stator and the output member with the two epicyclic movements cooperating to provide an integrated motor transmission unit.

3,577,050

VEHICLE DRIVEN BY SYNCHRONOUS MOTORS

William L. Ringland, Greendale; Manfred E. Neumann, New Berlin; Ernst K. Kaeser, West Allis; Thomas P. Gilmore, Wauwatosa, and Allois F. Geiersbach, Milwaukee, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 27, 1969, Ser. No. 853,462
Int. Cl. H02p *5/22*
U.S. Cl. 318—146 **58 Claims**



The wheels of a vehicle are driven by inductor type synchronous motors having solid rotors without windings and commutators. A diesel on the vehicle drives a pair of high frequency rotating generators each of which supplies power to a pair of the synchronous motors. Power pedal means actuated by the operator derive a power signal proportional to the desired tractive effort for the vehicle. A separate electric drive for each motor includes means for deriving a control signal modulated at motor speed, a cycloconverter between each motor and its generator regulated by the control signal, tachometer means for deriving a speed signal which is a function of motor speed, and control means responsive to both the power signal and speed signal for regulating the magnitude and phase of the control signal so that the motor output power is constant over the speed range at a level in accordance with the power pedal setting.

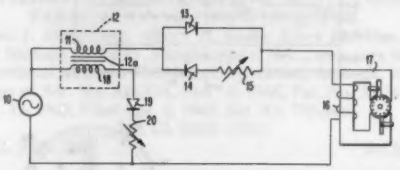
Brake means actuated by the operator derive a brake signal, and the vehicle has means for shifting the phase of the control signals for all the motors to regeneratively brake them when the brake signal exceeds the power signal. The vehicle has travel direction selector means for shifting the phase of all the control signals to reverse the direction of motor rotation and thus propel the vehicle backward. The vehicle has manually operated means for setting a speed limit for the vehicle and means for deriving a speed limit signal which is additive to the brake signal to regeneratively brake the motors when vehicle speed exceeds the set speed limit. Turn compensation means increase the power supplied to the motors of the wheels on the outside of a turn and decrease the power supplied to the motors of the wheels on the inside of the turn as a function of the degree of turn and the magnitude of the power signal.

3,577,051

MOTOR SPEED CONTROL CIRCUIT HAVING VARIABLE REACTIVE IMPEDANCE MEANS

Herbert R. Montague, Binghamton, N.Y., assignor to Power Concepts Corporation, Hallstead, Pa.

Filed May 19, 1969, Ser. No. 825,617
Int. Cl. H02p *3/24*
U.S. Cl. 318—212 **5 Claims**



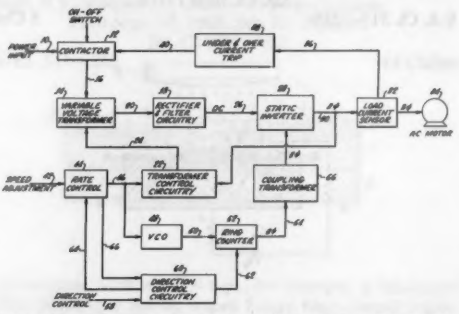
A speed control circuit for induction motors, such as the shaded-pole type, in which a pair of oppositely poled, parallel-connected diodes are connected between an alternating current source and the motor. There is a variable resistor in series with one of the diodes to vary the direct current component supplied to the motor and control the motor speed. A saturable reactor is included in series with the diodes to also vary the circuit impedance and thereby reduce the energy dissipation required at low motor speeds.

3,577,052

AC MOTOR CONTROL SYSTEM WITH SYNCHRONOUS SPEED CHANGE

David Elvis Bauer, 1800 W. Gromercy #21, Anaheim, Calif.

Filed Oct. 17, 1968, Ser. No. 768,295
Int. Cl. H02p *5/28, 5/40*
U.S. Cl. 318—230 **32 Claims**



A variable DC power source supplies a DC voltage to a static inverter which provides a three-phase alternating voltage output to drive an AC motor. A ring counter which is cycled by a voltage controlled oscillator generates three-phase timing signals to control the frequency of the inverter output. An input control signal is coupled to the voltage controlled oscillator through a rate control means. The rate control means generates a voltage output to the voltage controlled oscillator which is proportional to the input control signal and follows and adjustment of the input control signal from one level to another at a predetermined rate. The output generated by the rate control means also controls the magnitude of the DC voltage output of the DC power source. An adjustment of the input control signal results in a proportional change in the magnitude and the frequency of the inverter output.

3,577,053

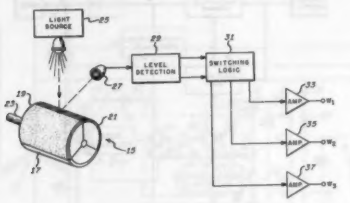
BRUSHLESS DC MOTOR INCLUDING A VARIABLE ATTENUATOR FED COMMUTATOR

Joe H. McGee, Charlottesville, Va., assignor to Sperry Rand Corporation

Filed Feb. 17, 1969, Ser. No. 799,851
Int. Cl. H02k *29/02*
U.S. Cl. 318—254 **3 Claims**

A brushless DC motor includes a cylindrical reflecting member on the rotor. The cylindrical surface of the reflect-

ing member is divided into arcuate sections equal in number to the number of stator coils in the motor, and each having a different level of reflectivity. Light from a stationary source illuminates the adjacent arcuate section and is reflected onto a stationary sensing element. The input to the sensing element is dependent upon the level of reflectivity of the section that happens to be adjacent the light source. A logic circuit directs the output of the sensing element to the particular stator coils corresponding to the intensity of light reaching the sensor at that time.

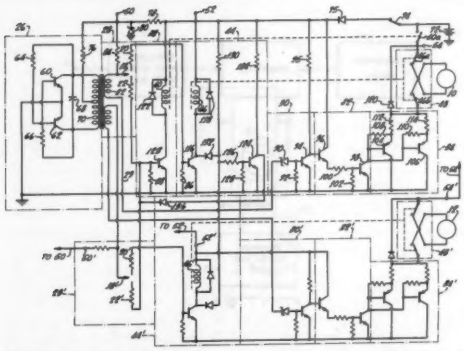


3,577,054

REVERSIBLE FAIL-SAFE WHEELCHAIR DRIVE CONTROL CIRCUIT

Roger W. Banks, Costa Mesa, Calif., assignor to Everest & Jennings, Inc.

Filed Jan. 24, 1969, Ser. No. 793,747
Int. Cl. H02p *1/22*
U.S. Cl. 318—257 **7 Claims**



A drive control circuit for a motorized wheelchair whereby the wheelchair occupant can select both the direction and the rate of motion of the chair by means of a joystick. In both directions the same motor control circuit is used. To prevent a runaway motor condition which might be caused by a component breakdown in the drive control circuit, means are provided to deenergize the wheelchair motor rapidly.

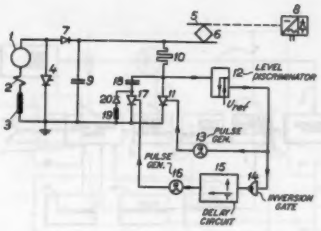
3,577,055

MEANS FOR REGENERATIVE BRAKING OF AN IMPULSE-CONTROLLED DIRECT CURRENT SERIES MOTOR

Fredrik Hermansson, deceased late of Sweden, by Ingrid Hermansson, Administrator, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 3, 1968, Ser. No. 734,062
Claims priority, application Sweden, June 9, 1967, 8096/67
Int. Cl. H02p *5/04*
U.S. Cl. 318—302 **1 Claim**

An arrangement for regenerative braking of a thyristor-controlled DC series motor used as driving motor for street cars. During braking possible excess energy is consumed by a resistor connected in parallel with the motor. The resistor is connected in series with a switching means for connecting and disconnecting the resistor at an upper and lower voltage level, respectively.

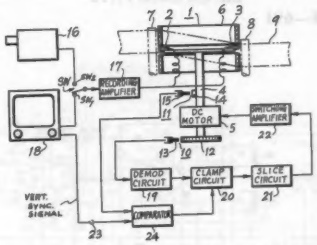


3,577,056

DC MOTOR SERVOSYSTEM

Kazunobu Tsujikawa, Tokyo, Japan, assignor to Sony Corporation, Shinagawa-ku, Tokyo, Japan

Filed Mar. 12, 1969, Ser. No. 806,352
Claims priority, application Japan, Mar. 13, 1968, 43/16283
Int. Cl. H02p *5/16*
U.S. Cl. 318—314 **6 Claims**



In order to control the phase and speed of a DC motor, particularly employed for driving the rotary magnetic heads of a video tape recorder, the output of a signal generator having a frequency corresponding to the rotational speed of the motor is fed through a demodulation circuit to a clamping circuit, and the rotational speed of the motor is controlled in accordance with variations in an output level resulting from the slicing of the output of the clamping circuit at a reference level. Simultaneously, the rotational position of the DC motor is detected and compared with an external reference signal, for example, the synchronizing signal of a television signal, and the clamp level of the clamping circuit is controlled by the output resulting from the comparison, thereby to drive the motor in synchronism with the external reference signal.

3,577,057

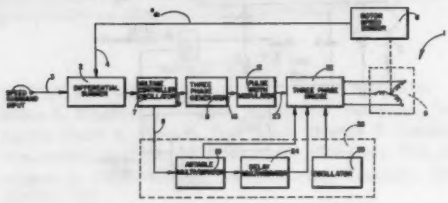
SYSTEM FOR CONTROLLING THE SPEED OF A MOTOR UTILIZING PULSE WIDTH MODULATION

George A. Dyer, Santa Ana, and Emil Kohler, Anaheim, Calif., assignor to North American Rockwell Corporation

Filed Sept. 26, 1969, Ser. No. 861,397
Int. Cl. H02p *7/14*
U.S. Cl. 318—328 **8 Claims**

An input voltage is summed with a voltage picked off from a polyphase motor for driving a voltage-controlled oscillator. The frequency of the output signal from the oscillator is dependent on the magnitude of the summed voltage. The pulse width is modified within a predetermined range as a function of the frequency and is converted into three phase signals

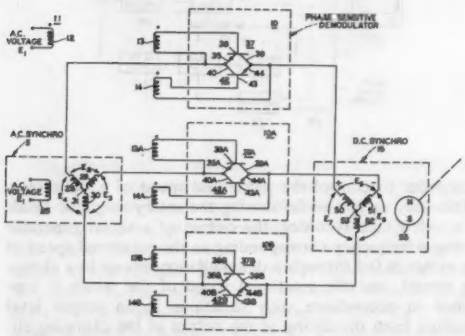
which are summed and applied to the stator windings of a motor. The signal across the windings has an optimum voltage and frequency ratio which is varied when the speed of the motor is changed.



3,577,058
SELF-SYNCHRONOUS MOTOR CONTROL INCLUDING AN AC TRANSMITTER, A DC RECEIVER, AND A UNIQUE AMPLIFIER-DEMODULATOR

Richard L. Cohen, Old Bridge, N.J., assignor to The Bendix Corporation

Filed Dec. 19, 1968, Ser. No. 785,133
Int. Cl. G05b *11/12*
U.S. Cl. 318—691 5 Claims



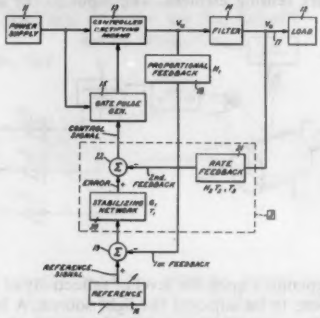
An indicating system including AC synchro transmitters providing AC signals corresponding to a condition. The AC signals are demodulated by phase-sensitive demodulators and the rectified signals are applied to DC synchro receivers operating an indicator for indicating the condition.

3,577,059
ELECTRIC POWER APPARATUS COMPRISING CONVERTER, FILTER, REGULATOR, AND MEANS FOR DYNAMICALLY STABILIZING THE FILTER

Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company

Filed Mar. 17, 1969, Ser. No. 807,867
Int. Cl. H02m *1/14, 7/12*
U.S. Cl. 321—10 6 Claims

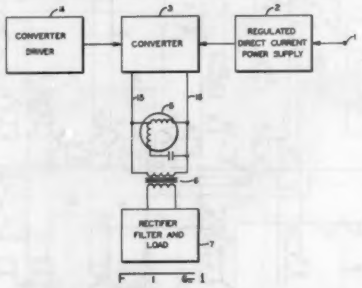
In electric power apparatus including a voltage-regulated converter and a filter supplying a load circuit with relatively smooth unipolarity voltage of desired magnitude, the filter is stabilized by connecting rate feedback means to its output for deriving a negative feedback signal that dominates the dynamic response of the regulator to source or load disturbances.



3,577,060
ALTERNATING CURRENT POWER SUPPLY EMPLOYING PROGRAMMED TURN-ON AND TURN-OFF

William E. Richeson, Jr., Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 10, 1969, Ser. No. 805,729
Int. Cl. H02m *1/18*; H02h *7/14*; H02m *5/44*
U.S. Cl. 321—11 6 Claims



A reliability of a high-power alternating power supply wherein a low-power alternating current is used to convert a high-power direct current to said high-power alternating current is improved, when driven by sources and when driving loads that are inductive or inductively coupled, by the use of a programmed turn-on and turnoff procedure wherein the energy supplied to a reactive load is gradually increased and diminished respectively.

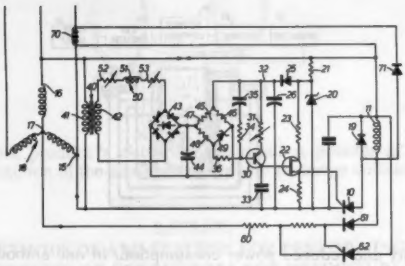
3,577,061
CONTROL APPARATUS FOR ELECTRIC ALTERNATORS

Peter J. Wyles, Stamford, England, assignor to Newage Lyon Limited, Stamford, England

Filed July 19, 1968, Ser. No. 746,108
Claims priority, application Great Britain, July 19, 1967, 34274/67
Int. Cl. H02p *9/08, 9/14*
U.S. Cl. 322—27 1 Claim

In automatic regulating apparatus for an electric alternator a main thyristor is connected in series with an excitation winding across the alternator terminals and is controlled by a sensing circuit to which a signal corresponding to the alternator output voltage is passed. A saturable current transformer

has a primary winding in the load circuit of the alternator and a secondary winding connected through a rectifier to the



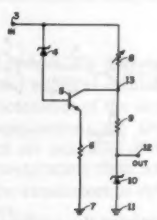
excitation coil to build up the excitation when the alternator has to start up under a permanently connected load, without interferring with control once the voltage has built up.

3,577,062

ZENER DIODE REFERENCE CIRCUIT INDEPENDENT OF INPUT VOLTAGE CHANGES

Eric J. Hoffman, Baltimore, Md.

Filed Feb. 19, 1969, Ser. No. 800,917
Int. Cl. G05f *1/44*
U.S. Cl. 323—8 **6 Claims**



A Zener diode voltage reference circuit whose output is maintained at exactly the Zener voltage irrespective of changes in the input voltage. More particularly, since the voltage appearing across a Zener diode fluctuates slightly with changes in the Zener current, exact regulation is accomplished by maintaining the current flowing through the diode at a constant value; furthermore, the Zener current is held constant by adding to the circuit a second Zener diode which serves to extract from the first Zener diode all the current which would cause a voltage fluctuation.

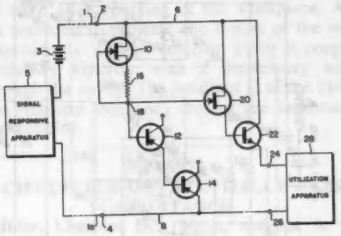
3,577,063

VOLTAGE REGULATOR WITH INSIGNIFICANT CURRENT DRAIN

Edward T. E. Hurd, III, Willingboro, N.J., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 3, 1969, Ser. No. 795,886
Int. Cl. G05f *3/08*
U.S. Cl. 323—16 **5 Claims**

A voltage-regulating buffer, designed for use with a two-wire current signal transmitter, for limiting the line voltage which may be applied to the transmitter without adversely affecting the current signal from the transmitter. The buffer includes a series voltage-regulating element which is, in turn, controlled by a shunt control circuit. The shunt control circuit includes a series connected constant current unit and constant voltage unit.

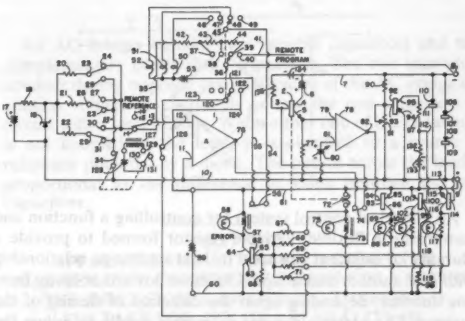


3,577,064

AUTOMATIC ERROR DETECTION AND INDICATION IN A REMOTELY PROGRAMMABLE REGULATED POWER SUPPLY

Sarkis Nercessian, Long Island City, N.Y., assignor to Forbro Design Corp., New York, N.Y.

Filed Mar. 12, 1969, Ser. No. 806,385
Int. Cl. G05f *1/58*
U.S. Cl. 323—20 **12 Claims**



A programmable regulated power supply includes internal control circuits for determining the output voltage and digital visual read-out indicators showing the output voltage called for by the control circuits. In the operation of this power supply there are a number of predetermined circuit conditions which may result in the actual output voltage being different from the called for voltage. These conditions are detected and indicated individually and collectively. Certain of these conditions when detected serve to also extinguish the visual indicators.

3,577,065

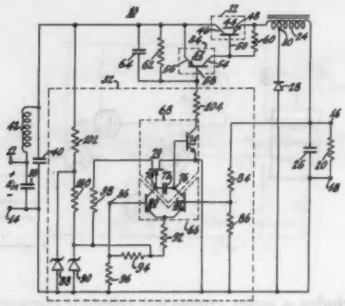
SWITCHING REGULATOR HAVING A DIODE CONNECTED TO AN INTERMEDIATE TAP OF A CHOKE

Franz Ludwig Putzrath, and Charles Allan Michel, Haddonfield, N.J., assignors to RCA Corporation

Filed Nov. 21, 1968, Ser. No. 777,654
Int. Cl. G05f *1/56*
U.S. Cl. 323—22 **9 Claims**

A switching regulator having a switching device, a choke and a load connected in series with a pair of input terminals. The regulator further includes a diode tapped back on the choke to prevent current spikes at the output. By tapping the diode back on the choke, a voltage is induced in the tapped

portion at the time the switch becomes short circuited and this voltage limits the current flowing through the switch during the time necessary for the diode to become reversed biased.



3,577,066

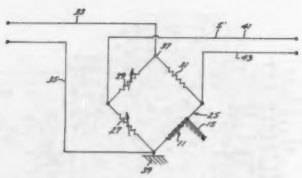
ELECTRICAL CONTROL SYSTEM

Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 7, 1969, Ser. No. 805,138

Int. Cl. G05f *3/02*; G01r *17/02*

U.S. Cl. 323—69 **6 Claims**



An electrical control system for controlling a function and comprising a flexible, variable resistor formed to provide a plurality of adjacent portions in heat exchange relationship with one another and adapted to move toward or away from one another, depending upon the direction of flexing of the resistor. The variable resistor is flexible axially to adjust the spacing between the adjacent portions to thereby vary the mutual heat transfer therebetween. This moves the electrical resistance of the flexible resistor to effect changes in the rate of current flow therethrough. A control means in circuit with the resistor is operative in response to said current changes to control the function.

3,577,067

PERSISTENT MODE SUPERCONDUCTIVE ORTHOGONAL GRADIENT CANCELLING COILS

Harry E. Weaver, Jr., Portola Valley, Calif., assignor to Varian Associates, Palo Alto, Calif.

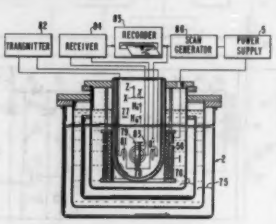
Filed May 11, 1966, Ser. No. 549,353

Int. Cl. G01n *27/28*

U.S. Cl. 324—0.5 **5 Claims**

A superconductive magnet is disclosed together with superconductive gradient cancelling coils for homogenizing the magnetic field produced by the magnet. A gyromagnetic spectrometer is also disclosed which employs the magnetic field produced by the superconductive magnet. The gradient cancelling coils include a plurality of turns of a superconductor arranged adjacent the region of the magnetic field to be corrected, such magnetic field having certain residual magnetic field gradients therein to be cancelled.

Means are provided for energizing the gradient cancelling coils with electrical currents in such a configuration as to define orthogonal superconductive gradient cancelling coils. A superconductive connection is formed across the ends of the coil structure for closing the superconductive circuit across the ends of the coil to form a closed superconductive circuit, whereby the superconductive gradient cancelling coils may be operated in a persistent mode for enhanced stability and reduced power consumption. In one embodiment, a DC transformer is provided which has a primary winding coupled to the main magnetic field of the magnet and a secondary winding which serves to energize the gradient cancelling coils. In this manner, the gradient cancelling field components change their intensity in proportion to changes in intensity of the main magnetic field to maintain a corrected field.



3,577,068

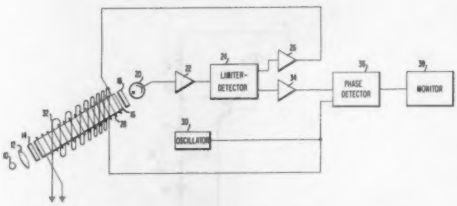
OPTICALLY PUMPED MAGNETIC GRADIOMETER

Richard C. La Force, Grosse Point, Mich., assignor to Atlantic Richfield Company

Filed Aug. 27, 1968, Ser. No. 755,599

Int. Cl. G01r *33/08*

U.S. Cl. 324—0.5 **7 Claims**



Apparatus for determining the gradient of the earth's magnetic field over a zone. The absorption magnetometer is encircled by a coil of wire coupled to a low frequency oscillator. The turns of the coil are unevenly spaced along the length of the cell and are canted with respect to the cell so that the magnetic field caused by current in the coil is inhomogeneous and offsets the gradient in the earth's magnetic field. The magnetometer's radio frequency output signal is amplitude modulated by a signal having the frequency of the oscillator output and having an amplitude proportional to the gradient of the earth's magnetic field. This modulation signal is amplitude detected and then phase detected using the oscillator output as a reference. The phase detector output is a signal indicative of the earth's magnetic field gradient.

3,577,069

OPTICAL RESONANCE CELLS CONTAINING AN ALLOY OF AN ALKALI METAL WITH ANOTHER METAL

Leon Malnar, and Henri Brun, Paris, France, assignors to CSF Compagnie Generale De Telegraphie Sans Fil

Filed Feb. 3, 1969, Ser. No. 796,355

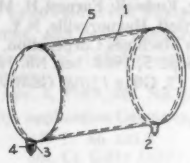
Claims priority, application France, Feb. 5, 1968, 138,698

Int. Cl. G01r *33/08*

U.S. Cl. 324—0.5 **11 Claims**

An optical resonance cell containing an alkali vapor to be optically pumped and comprising a bulb communicating with

the cell. An alloy of the alkali metal with another metal is placed in the bulb. This metal is so selected that the atoms of



its vapor produce a disturbance as small as possible of the spin function of the alkali atoms, by spin exchange collisions.

3,577,070

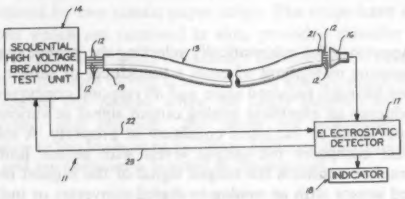
METHODS OF AND SYSTEMS FOR PERFORMING TESTING OF CONDUCTORS FOR DEFECTIVE INSULATION AND CONTINUITY

Howard C. Whitekettle, Jr., Towson, Md., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed Apr. 8, 1969, Ser. No. 814,341

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **10 Claims**



Methods of and systems for applying a voltage difference between at least two adjacent insulated conductors, testing for electrical characteristics of the insulated conductors as a result of the application of the voltage difference therebetween which are indicative of defective insulation and detecting for an electrostatic field adjacent to an end of a particular one of the conductors to determine if the one conductor is continuous.

3,577,071

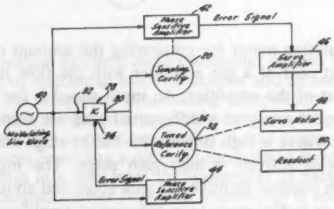
MICROWAVE MATERIAL TESTER

Jack T. Collins, Boulder, Colo., assignor to Automation Industries, Inc., Century City, Calif.

Continuation of application Ser. No. 573,252, Aug. 18, 1966, now abandoned. This application Jan. 6, 1969, Ser. No. 789,203

Int. Cl. G01r *27/04*

U.S. Cl. 324—58.5 **2 Claims**



A nondestructive testing device is described wherein a workpiece is coupled to a microwave resonant cavity. In addition to the sampling cavity, a tuneable reference resonant cavity may be employed. A modulated tuneable klystron energizes both resonant cavities. A first phase-sensitive amplifier, responsive to the test cavity, controls a servosystem tuning the reference resonant cavity while a second phase-sensitive amplifier responsive to the reference resonant cavity tunes the klystron so that both cavities and the klystron are tuned alike after coupling of the workpiece. A digital readout is provided to indicate the tuning of the reference cavity. Alternatively, a single resonant cavity is coupled to a swept frequency klystron, with a filamentary workpiece passed through the cavity. The resultant Q of the cavity, and changes in resonant frequency thereof are indicated by an oscilloscope display.

3,577,072

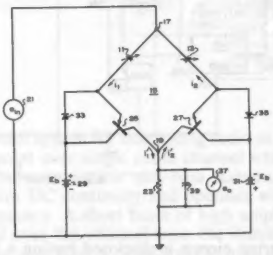
BRIDGE CIRCUIT FOR DIFFERENTIALLY MEASURING CAPACITANCE

Arthur Miller, Chestnut Hill, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 19, 1968, Ser. No. 777,033

Int. Cl. G01r *27/26, 27/00*

U.S. Cl. 324—60C **6 Claims**



An AC bridge includes two variable capacitors and two complementary conductivity transistors. The two transistors conduct during opposite one-half cycles of the AC bridge excitation voltage to alternately couple the two capacitors in circuit with a load resistor. When either one of the capacitors is not coupled to the load, it is clamped to a source of reference potential by a diode. The output across the load is proportional to the difference in value between the two capacitors.

3,577,073

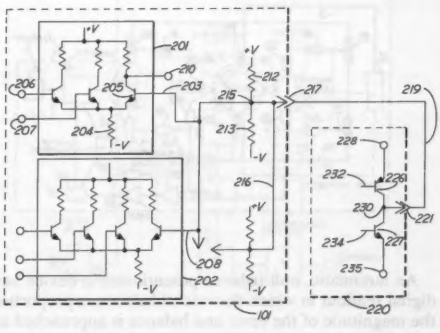
APPARATUS FOR AUTOMATED COMPUTER MAINTENANCE COMPRISING MEANS FOR VARYING THE INPUT SIGNAL SWITCHING THRESHOLD VOLTAGE FOR ANY OF A PLURALITY OF ELECTRONIC CIRCUITS

Seymour R. Cray, Chippewa Falls, Wis., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Feb. 18, 1969, Ser. No. 800,105

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 **7 Claims**



An apparatus for providing the automated maintenance checkout of large-scale computers by selectively stressing the

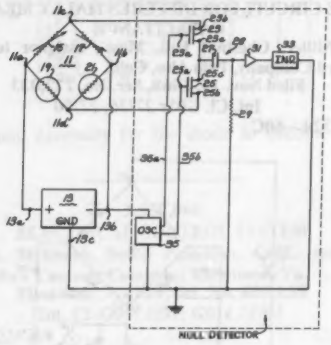
operating voltage margins of any of the plurality of electronic logic modules comprising the computer is disclosed. The selective stressing is accomplished under the control of an auxiliary data processing system.

3,577,074

BRIDGE MEASURING CIRCUIT

Julius Praglin, Beachwood, Ohio, assignor to Keithley Instruments, Inc., Solon, Ohio

Filed Oct. 15, 1968, Ser. No. 767,745
Int. Cl. G01r *17/02, 27/02*
U.S. Cl. 324—98 **2 Claims**



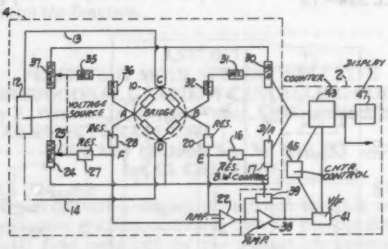
A measuring circuit is disclosed having a bridge with the input terminals connected to the positive and negative output terminals of a regulated power supply. The difference in potential between the output terminals of the bridge is adapted to be sensed by a null detector having a ground reference terminal provided by the power supply. In the null detector an indicator is connected to the bridge output terminals through an RC coupling network and MOS field-effect devices which are alternately rendered conductive by an oscillator. The polarizing voltage provided by the power supply for the bridge has a common ground with the null detector.

3,577,075

DIGITAL SERVO INDICATOR

Algirdas J. Krygeris, Richmond Heights, Ohio, assignor to Gilmore Industries, Inc., Cleveland, Ohio

Filed Nov. 14, 1968, Ser. No. 775,664
Int. Cl. G01r *17/06, 1/02*
U.S. Cl. 324—99 **4 Claims**



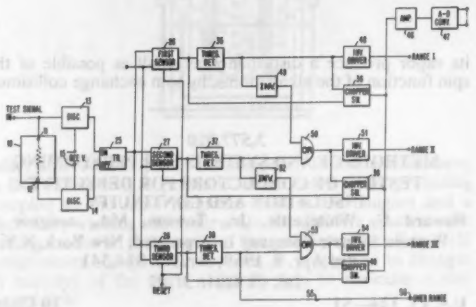
An automatic, null-balance potentiometric device having a digital readout in which the rate of balance is proportional to the magnitude of the error and balance is approached asymptotically on an exponential curve, such device providing improved damping characteristics and noise reduction whereby accurate resolution to a hundredth of a microvolt is obtained.

3,577,076

AUTOMATIC RANGE SCALE SELECTION APPARATUS FOR A MEASURING DEVICE

James E. Frushour, Endwell; Earnest H. Millham, Apalachin, and James E. Ortloff, Harpursville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1968, Ser. No. 757,715
Int. Cl. G01r *15/08;* **G04f** *9/00*
U.S. Cl. 324—115 **5 Claims**



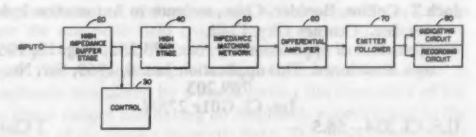
Apparatus for automatically selecting the proper scale in a measuring instrument wherein a transducer or sensor is provided for each required scale and all respond concurrently by producing an electrical analog output signal at various rates proportional to the input condition or property. A selection circuit compares the output levels with sensor limits and thereafter connects the output signal of the highest nonsaturated sensor with an analog-to-digital converter or indicating means.

3,577,077

APPARATUS FOR MEASURING THE AMOUNT OF MODULATION RESPONSE TO A DIFFERENTIAL INPUT SIGNAL

Sylvan A. Walliser, and Claire F. Asquith, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Dec. 13, 1968, Ser. No. 783,645
Int. Cl. G01r *7/00*
U.S. Cl. 324—140 **7 Claims**

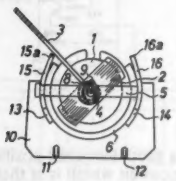


A modulation meter for comparing the amount of flow in one output port of a gas amplifier with the flow in another output port of the amplifier. An input signal is fed from the output ports by way of a differential pressure transducer to the meter where a high impedance buffer stage responds to the signal to activate a high gain stage. The input signal response is coupled through the gain stage and an impedance matching or buffer stage to a differential amplifier. The differential amplifier responds to signal changes by varying the current controlled to a load meter that indicates the gas flow. All stages are transistorized and the differential amplifier has an emitter follower output circuit that prevents loading of the differential amplifier by the meter.

3,577,078
ELECTRICAL MEASURING OR INDICATING INSTRUMENT

Willy Kisselmann, Grunwald; Fritz Rumpelein, Munich; Paul Kopf, Unterhaching, and Franz Landbrecht, Unterhaching, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 1, 1969, Ser. No. 811,739
Claims priority, application Germany, Apr. 3, 1968, P 17 66 101.7
Int. Cl. G01r *1/00*
U.S. Cl. 324—154 9 Claims

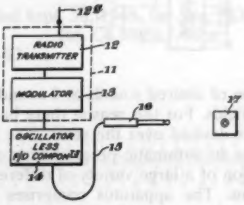


A moving-coil instrument wherein the end positions of the pointer which shares oscillatory movements of the coil are determined by two elastic paper strips. The strips have inner portions which are received in slots provided therefor in a support which constitutes or includes the instrument housing, and outer portions having transversely extending edges which abut against the pointer when the latter assumes the corresponding end position. The strips are adjustable with reference to the support to facilitate calibration of the instrument and are thereupon bonded to the support.

3,577,079
WATCHMAN'S RADIO LOCATION INDICATING SYSTEM

Kenneth John Horstmann, 14 Park Lane, Bath, Somerset, and Colin Grahame Douglas, "Stoneybroke" Watergate, Colerne, Wiltshire, England

Filed May 31, 1968, Ser. No. 733,675
Claims priority, application England, May 31, 1967, 25198/67
Int. Cl. H04b *1/02*
U.S. Cl. 325—53 4 Claims



In a location system a radio transmitter carried by a security guard or watchman has a modulator and an oscillator, but without the frequency determining components. At various points which the guard is required to visit are sets of frequency determining components carried in wall boxes, each set of components providing a different modulating frequency. The guard plugs in a lead from the transmitter at each point and the modulated carrier from the transmitter is received at a remote location, demodulated, and the point at which the modulating frequency was generated is identified.

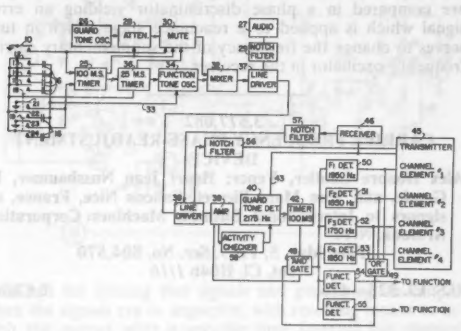
ERRATUM

For Class 325—73 see:
Patent No. 3,577,073

3,577,080
REMOTE CONTROL SYSTEM FOR OPERATION OVER SAME AUDIOCHANNEL PROVIDING VOICE SIGNALS BETWEEN REMOTE STATION AND BASE STATION

Gary A. Cannalte, Hoffman Estates, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 20, 1968, Ser. No. 785,526
Int. Cl. H04b *1/60*
U.S. Cl. 325—183 20 Claims

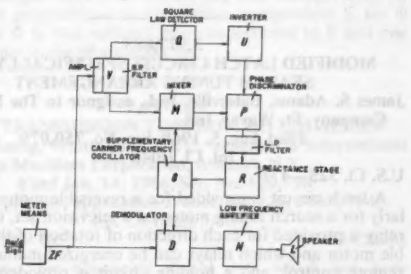


Remote control system for controlling radio at base station from remote point over single audio channel which provides voice signals between remote and base stations, and which does not require DC continuity and operates within a fixed maximum frequency. A short burst of high amplitude guard tone is applied over the channel from the remote station to the base station to actuate a control at the base station which renders the controls thereat operative and blocks transmission of audiosignals from the base station to the channel. The remote station then applies lower amplitude tones to the audiochannel to actuate controls at the base station, with guard tone being applied continuously at low level during application of audio signals from the remote station to the base station. The base station responds to termination of tone signals (or to disconnect tones) to provide disconnect action, reset the controls and permit the base station to apply signals to the audio channel.

3,577,081
METHOD AND ARRANGEMENT FOR SYNCHRONIZATION OF THE SUPPLEMENTARY CARRIER FREQUENCY OSCILLATOR

Hansrichard Schulz, Villingen, Black Forest, Germany, assignor to Saba Schwarzwalder Apparate-Bau-Anstalt August Schwer Sohne GmbH, Villingen, Schwarzwald, Germany

Filed June 26, 1968, Ser. No. 740,238
Int. Cl. H04b *1/68*
U.S. Cl. 325—329 6 Claims



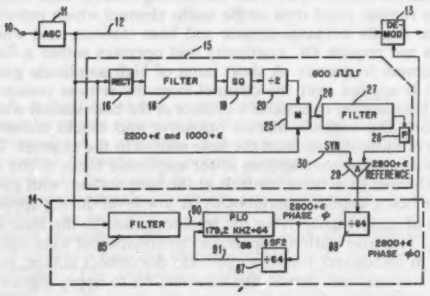
A suppressed carrier single sideband signal is received, converted to an intermediate frequency, and fed to a preferably square law detector for generating a reference

signal derived from the difference in frequency between a harmonic and the fundamental of the modulation frequency, or between two harmonics of the modulation frequency. The intermediate frequency signal is also fed to a mixer where it is combined with the supplementary carrier frequency oscillator signal thus generating a low frequency signal whose exact frequency depends both on the modulation signal frequency and any difference in frequency between the transmitter carrier frequency and the receiver supplementary carrier frequency. The reference signal and low frequency signal are compared in a phase discriminator yielding an error signal which is applied to a reactance stage which in turn serves to change the frequency of the supplementary carrier frequency oscillator in the receiver.

3,577,082
CARRIER FREQUENCY PHASE-READJUSTMENT DEVICE

Alex Honore Lautier, Vence; Henri Jean Nussbaumer, La Gaude, and Jean Marc Pierret, Falicon Nice, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1969, Ser. No. 804,570
Int. Cl. H04b *1/16*
U.S. Cl. 325—416 **6 Claims**



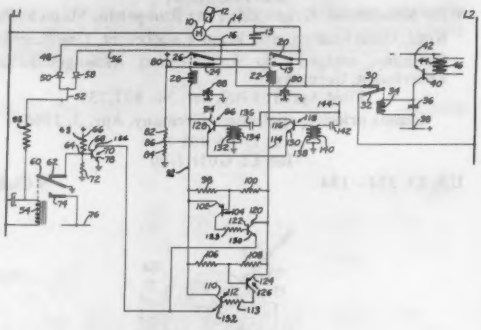
A phase synchronizing device for the carrier of a single sideband transmission system. Two pilot frequencies are transmitted with the synchronization signal and are decoded at the receiver to provide a signal indicating the correct phase of the demodulating carrier signal. The transmitted carrier signal controls the frequency of an oscillator and the initial phase of the regenerated carrier signal is set a the start of reception by the decoded pilot signals.

3,577,083
MODIFIED LATCH CIRCUIT SPECIFICALLY FOR SEARCH TUNING ARRANGEMENT

James S. Adams, Batesville, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.

Filed Aug. 5, 1968, Ser. No. 750,079
Int. Cl. H04b *1/32*
U.S. Cl. 325—471 **10 Claims**

A latch circuit is provided for a reversible motor, particularly for a search tuning motor on a television set, in which a relay is provided for each direction of rotation of the reversible motor and which relays can be energized manually or by remote control, and a holding circuit is provided for each relay comprising the collector-emitter circuit of a pair of serially arranged transistors, the second transistor in each pair of serially arranged transistors being the same transistor and being normally nonconductive and becoming conductive upon energization of the motor to run in either direction. The energization circuit to the motor is deenergized when

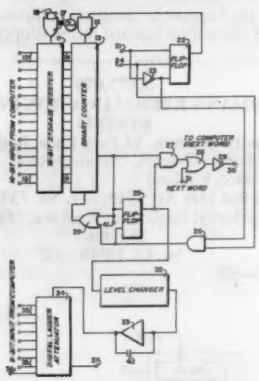


the motor reaches a predetermined position and this also interrupts the holding circuit which is at that time effective.

3,577,084
COMPUTER SOUND GENERATOR

Samuel M. Atcherson, Bowie, and Robert P. Rodgers, Silver Spring, Md., assignors to Singer-General Precision, Inc., Binghamton, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,193
Int. Cl. H03k *23/00*
U.S. Cl. 328—14 **10 Claims**



The generation of desired sounds and sound waveforms is useful in many fields. For this reason there have been many sound generators devised over the years. The system of this invention utilizes an automatic programming device to control the generation of a large variety of different sounds and sound waveforms. The apparatus comprises a flip-flop or similar device having a plurality of stable conditions. The flip-flop is alternately placed in each of its stable operative states under the control of an automatic programming device. The duration of a complete flip-flop cycle is determinative of the frequency of the generated waveform. The flip-flop output which may be processed through wave-shaping circuitry is subsequently amplitude controlled by a digital ladder attenuator. One automatic programming device which has been useful in this system is a general-purpose digital computer. The system described herein is an improvement over the systems described in the copending patent applications Ser. No. 707,615, SOUND GENERATOR, filed in the names of William E. Beavers, Jr. and William H. Sturdevant, and Ser. No. 710,237, COMPUTER SOUND GENERATOR, filed in the names of Robert A. Atchison, Robert E. Lutolf, and Edward F. Magee.

3,577,085

QUINARY REDUCTION STAGE AND FORWARD-REVERSE COUNTER

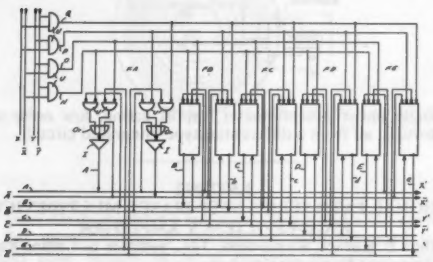
Theo Stutz, Geerlisbergstrasse, 8303 Bassersdorf, Switzerland

Continuation-in-part of application Ser. No. 679,966, Aug. 24, 1964, now abandoned, Continuation-in-part of application Ser. No. 538,663, Aug. 24, 1964, now abandoned, Continuation-in-part of application Ser. No. 392,998, Aug. 24, 1964, now abandoned, Continuation-in-part of application Ser. No. 279,039, May 6, 1963, now abandoned. This application Jan. 9, 1969, Ser. No. 856,225

Int. Cl. H03k *21/00*

Claims priority, applications Switzerland, May 4, 1962, Aug. 23, 1963, Apr. 7, 1965, Aug. 3, 1966, 5370/62, 10417/63, 4849/65 and 12559/66

U.S. Cl. 328—42 14 Claims



Two forms of a quinary reduction stage, for reducing the frequency of an input multiphase binary signal by a factor of five are illustrated. One corresponds to the use of a substantially minimum number of elements, while the other corresponds to use of identical binary circuits, all having the same number of inputs. By counting quarter periods of the input signal and half periods of the output signal, a decade reduction stage results. Further, each quinary reduction stage may be connected with a binary reduction stage thus furnishing a decade reduction stage, which may interconnect with other similar ones to constitute a decade forward-reverse counter.

3,577,086

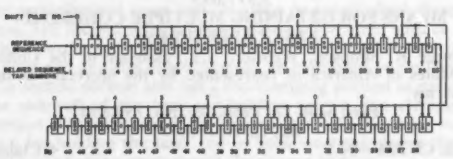
GENERATOR OF DELAYED SEQUENCES EMPLOYING SHIFT REGISTER TECHNIQUES

Ivan M. Kliman, Glen Head, and Harold Smola, Carle Place, N.Y.

Filed Sept. 30, 1968, Ser. No. 763,677

Int. Cl. H03k *5/00*

U.S. Cl. 328—62 4 Claims



The circuitry involves a plurality of groups of shift register stages connected in cascade with temporary storage stages connected between each group of stages. A reference sequence is applied serially to the generator input and a number of substantially equally delayed replicas thereof are obtained from taps spaced along the generator, the number of the taps being different from the number of bits of the input reference sequence. In order to accomplish this, several different shift pulse trains must be applied to different of the groups of stages, the different shift pulse trains having different time delays or phases.

3,577,087

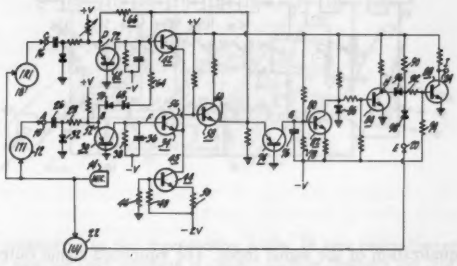
SEQUENCE "AND" GATE WITH RESETTING MEANS

Thomas B. Martin, Delran, and Henry J. Zadell, Haddonfield, N.J., assignors to Radio Corporation of America

Filed Sept. 27, 1968, Ser. No. 763,196

Int. Cl. H03k *5/20*

U.S. Cl. 328—110 6 Claims



Circuit for sensing two signals and producing an output when the signals are in sequence, with resetting means to inhibit the output after a specific time interval has elapsed between the two signals or whenever an intervening other signal occurs.

3,577,088

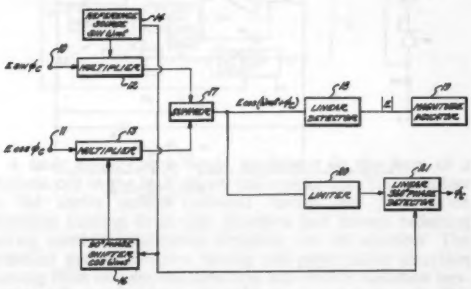
SINE-COSINE TO MAGNITUDE-PHASE ANGLE CONVERTER

William B. Goggins, Jr., Winchester, Mass., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Feb. 3, 1969, Ser. No. 795,796

Int. Cl. H03d *3/06*

U.S. Cl. 328—134 4 Claims



An analogue device for converting two voltages (AC or DC) each proportional to quadrature components E sin Φ and E cos Φ to two voltages, one proportional to E and one proportional to the phase angle Φ.

3,577,089

DATA TRANSMISSION TIME DOMAIN EQUALIZER

Etienne Gorog, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1966, Ser. No. 520,798

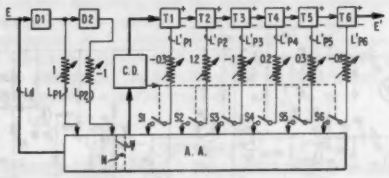
Claims priority, application France, Feb. 26, 1965, 7545

Int. Cl. H03k *5/00*

U.S. Cl. 328—165 3 Claims

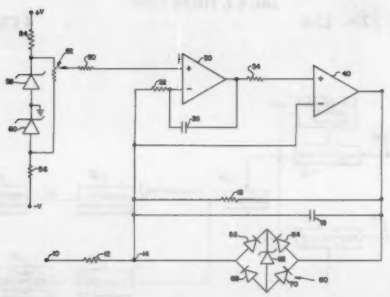
Apparatus for equalizing digital data which has been distorted in transmission. The value of the signal at each instant of time is delayed and modified by a weighting junction and added to the value of the signal input at the next instant of time in an analog adder. The output of the analog adder is applied to a series of cascaded digital correction devices, the

outputs of which are each connected through weighting junctions and switches to the analog adder to control the



equalization of the signal input. The equalized signal output is taken from the last of these cascaded correction devices.

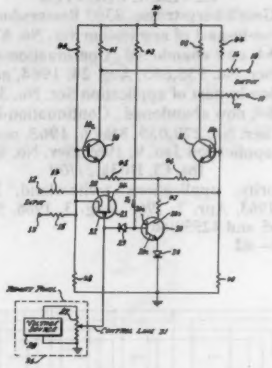
3,577,090
FAST SETTLING, STABLE AMPLIFIER CIRCUIT
William C. Montgomery, Jr., Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,840
Int. Cl. H03f *1/00*
U.S. Cl. 330—69 **5 Claims**



Two operational amplifiers are connected in series. The first operational amplifier has a very stable drift characteristic and a feedback capacitor such that it has a very low frequency breakpoint. The second operational amplifier has a very fast response characteristic but may have a poor drift characteristic. A feedback impedance connects the output of a second operational amplifier to the input of the first operational amplifier and the input to the entire circuit is through an input impedance to the inverting input of both the first and second operational amplifiers.

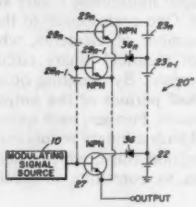
3,577,091
REMOTE CONTROLLED MONITOR CIRCUIT
Francis Rachal, Baltimore, and Donald B. McKone, Glen Burnie, Md., assignors to the United States of America as represented by the Secretary of the Air Force
Filed May 26, 1969, Ser. No. 827,553
Int. Cl. H03f *3/16, 3/8*
U.S. Cl. 330—24 **2 Claims**

An electronically operated remotely controlled circuit. The circuit provides desired logarithmic volume control from



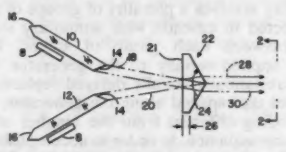
a single linear potentiometer, on-off gating, low noise and distortion, all from a differential-type integrated circuit.

3,577,092
SIGNAL PATH SERIES STEP-BIASED MULTIDEVICE HIGH-EFFICIENCY AMPLIFIER
Arthur P. Kubicz, Richardson, Tex., assignor to Collins Radio Company, Cedar Rapids, Iowa
Filed July 9, 1968, Ser. No. 743,525
Int. Cl. H03f *3/20, 3/68*
U.S. Cl. 330—124 **7 Claims**



A high-efficiency transformerless amplitude modulation system with an audio frequency power amplifier having at least two amplifier segments with at least one amplifier device in each, a different level voltage power supply for each amplifier segment, and a bias step between adjacent amplifier segments, and with a modulation output direct DC connection from the AFPA to the RF power amplifier of the system.

3,577,093
MEANS FOR OBTAINING MULTIPLE COHERENT-LASER APERTURES
George R. Simpson, Webster, N.Y., assignor to the United States of America as represented by the Secretary of the Army
Filed Sept. 13, 1968, Ser. No. 759,594
Int. Cl. H01s *3/05*
U.S. Cl. 331—94.5 **6 Claims**



Multiple coherent-laser apertures produced by directing

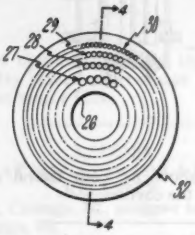
laser beams through a prism for optical interaction and coherence.

3,577,094

FRESNEL ZONE LASER COUPLING MIRROR

Richard G. Tomlinson, Glastonbury; Clyde O. Brown, Newington, and Alan F. Haught, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 27, 1968, Ser. No. 763,222
Int. Cl. H01s 3/08; G02b 5/18
U.S. Cl. 331—94.5 **1 Claim**



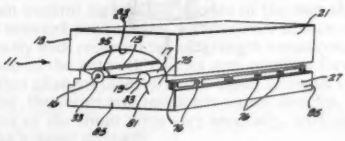
A laser cavity includes a spherical mirror and a flat mirror, the flat mirror having a plurality of holes arranged in a Fresnel zone pattern so as to provide distributed output coupling having a near-field focal point; alternatively, the flat mirror may comprise a pattern of reflecting material on a light-transmissive medium.

3,577,095

SEMIELLIPTICAL PUMP CAVITY

Richard C. Benner, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 28, 1966, Ser. No. 606,521
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 **5 Claims**



Cavity structure having a first section with a highly specularly reflective semielliptical inner surface and a second section of relatively high thermal conducting material enclosing the semielliptical inner surface along its longitudinal dimension. The second section has a relatively flat inner surface in which two longitudinal grooves are disposed, one for carrying a laser rod and the other carrying an elongated pump lamp. The second section also has a rod-clamping portion as part of the sidewall of the laser-rod-holding groove, the clamping portion extending above the second section's flat inner surface for holding the laser rod in both mechanical and thermally conducting contact with the second section.

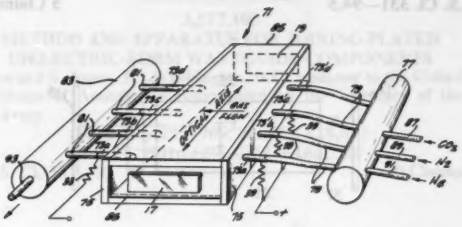
3,577,096

TRANSVERSE DISCHARGE GAS LASER

William B. Bridges, Thousand Oaks, and Peter O. Clark, Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 1, 1967, Ser. No. 679,704
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 **12 Claims**

This invention relates to a gas laser wherein laser energy regeneratively propagates along regenerative paths through a gaseous laser medium and between spaced reflectors. The laser medium is pumped to an excited state to generate laser energy along said regenerative paths by causing an electrical discharge to be maintained through the laser medium across



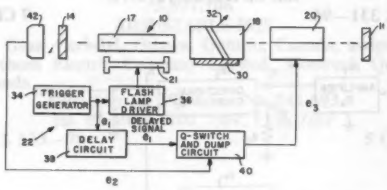
or transverse to the regenerative paths. In one embodiment, the gaseous laser medium is caused to flow through the laser cavity transverse to the laser optical path; and in another embodiment, a multiply folded path laser cavity is utilized.

3,577,097

LASER WITH COMBINED Q-SWITCH AND SYNCHRONIZED CAVITY DUMP CIRCUIT

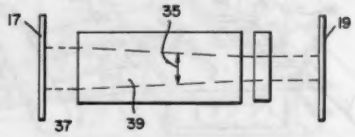
Ronald P. Hilberg, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 28, 1967, Ser. No. 686,076
Int. Cl. H01s 3/00
U.S. Cl. 331—94.5 **3 Claims**



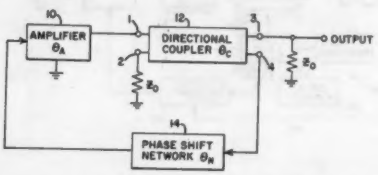
A laser employing a single modulator in the form of a Pockels cell in the laser cavity and a polarizer. The polarizer in the cavity passes radiation having one polarization direction coming from one direction and diverts radiation having another polarization direction into an absorber. The polarizer passes radiation having one polarization direction coming from an opposite direction and diverts radiation having the other polarization direction into an output path. The modulator in the cavity rotates the polarization direction of radiation to establish the other polarization direction when energized and permits passage of radiation when it is deenergized. A high voltage electrical waveform generator circuit is provided which generates a voltage waveform having a positive DC voltage leading edge and a negative DC voltage trailing edge to the modulator. A gas trigger tube is provided in the circuit which generates a positive DC voltage leading edge in its plate circuit when it is independently triggered by a trigger signal. Another gas trigger tube generates a positive voltage when it is triggered by another trigger signal from a photodiode positioned to intercept radiation leaking from laser cavity. A coupling circuit which couples the plate circuits of the trigger tubes includes a capacitor which converts the positive voltage generated by the other trigger tube into the negative DC voltage trailing edge of the voltage waveform. The coupling circuit may also include a differentiator which allows the voltage levels on the trigger tube plates to be independently varied without affecting each other.

3,577,098
THERMALLY COMPENSATED LASER
Harvey V. Winston, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed July 1, 1968, Ser. No. 741,682
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **5 Claims**



The invention is a laser in which an undesired thermal lensing effect of the active laser material is compensated by an addition of a material having a thermal lensing characteristic opposite that characteristic of the laser material. The active laser element and the compensating element are disposed within a regenerative cavity in a regenerative path defined between two end reflectors. As the active laser element is excited by pump energy, a thermal gradient in the laser material results from the excitation and a similar thermal gradient also results in the compensating material to negate the aforementioned thermal lensing effect.

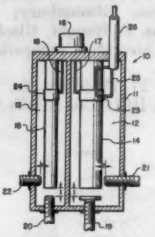
3,577,099
MICROWAVE OSCILLATOR HAVING DIRECTIONAL COUPLER IN FEEDBACK PATH
James A. Hall, and Harry J. Peppiatt, Lynchburg, Va., assignors to General Electric Company
Filed Feb. 27, 1969, Ser. No. 802,771
Int. Cl. H03b *5/12, 5/18*
U.S. Cl. 331—96 **7 Claims**



A microwave oscillator is provided with a solid-state amplifier device whose output is coupled to the input by a directional coupler. The oscillator characteristics can be reliably calculated, and the oscillator signals have a relatively small amount of noise.

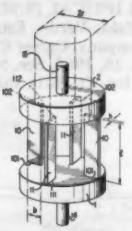
3,577,100
METEOROLOGICAL DEVICE EMPLOYING A TEMPERATURE COMPENSATED TRANSMITTER
Robert E. Askew, Berkeley Heights, and Henry C. Johnson, Neshanic, N.J., assignors to the United States of America as represented by the Secretary of the Army
Filed Feb. 28, 1969, Ser. No. 803,156
Int. Cl. H04b *1/02*
U.S. Cl. 331—117 **9 Claims**

This invention relates to a meteorological device that is used to transmit atmospheric conditions such as temperature, pressure, humidity, or the like, to a remote station. The transmitter of such device utilizes temperature-compensating means with a high-frequency transistor oscillator thereby obtaining a highly stable output over a wide temperature range. Temperature compensation is provided by mounting the transistor directly onto dual resonant coaxial cavities with one cavity connected to the transistor emitter and the other cavity connected to the base lead. The cavities are constructed of dissimilar metals thereby providing temperature dependent capacitance. The cavities are provided with sets of adjusting screws to provide for adjustments in cavity



resonance brought about by both lateral and transverse unequal expansion in the cavities.

3,577,101
ELECTROMECHANICAL TORSIONAL OSCILLATOR
Lotar Pege, Bad Schwalbach, Zur Hardt, Germany, assignor to Forschungslaboratorium, Prof. Dr. Ing. W. Heimann
Filed Oct. 16, 1968, Ser. No. 769,473
Claims priority, application Germany, Oct. 20, 1967, P 15 89 795.7
Int. Cl. G02f *1/34;* **H03b** *5/30*
U.S. Cl. 331—154 **9 Claims**

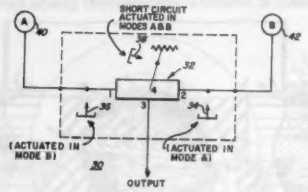


An electromechanical torsional oscillator for the modulation of devices for measuring electromagnetic radiation frequencies, the oscillator including a mechanical vibrator device with two opposing cylindrical plugs linked to one another by a plurality of double-cantilever-type leaf springs attached by their ends alternately to one or the other plug, so as to give the plugs only a single (rotational) degree of freedom relative to one another. The device further includes electromagnetic driving means to maintain an oscillating motion which, in an exemplary application, is used to vibrate the shading shutter of a radiation-modulating-type temperature-measuring apparatus. Means are provided to adjust the resonant frequency.

3,577,102
SUM OR SELECT NETWORK HAVING SHORT CIRCUITING MEANS CONNECTABLE TO HYBRID TEE CIRCUIT
Joseph Gindsberg, Brookline, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Dec. 30, 1968, Ser. No. 787,914
Int. Cl. H01p *1/10*
U.S. Cl. 333—7 **7 Claims**

This invention relates to a sum-or-select network for connecting two coherent sources of electrical power to a useful

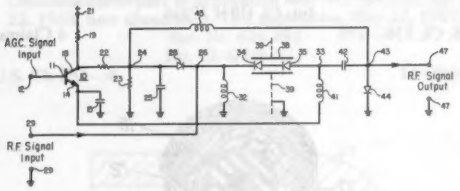
load such that the total available power from both sources, or either source alone, can be applied to the load with minimum loss. The network uses a single hybrid tee which can be connected to suitably placed short-circuit terminations if the power from either source fails.



3,577,103
VARIABLE ATTENUATOR FOR A WAVE SIGNAL RECEIVER

David E. Sparks, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Apr. 1, 1969, Ser. No. 811,893
Int. Cl. H04b *3/04;* **H01p** *1/22*
U.S. Cl. 333—17 **9 Claims**

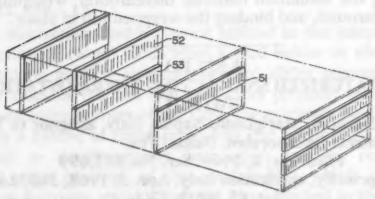


Attenuation of a received carrier, such as a television signal, may be made dependent on the carrier's signal strength by means of a pi network of variable-resistance diodes, the bias currents of which are controlled by an automatic gain control signal. The diodes in the two shunt arms of the pi network are supplied with forward bias currents that vary directly with received signal strength variations, whereas each diode in the network's series arm receives forward bias current that changes inversely with signal strength variations. In this way, the series arm resistance varies directly, while the resistances of the shunt arms vary inversely, with changes in the carrier's signal strength.

3,577,104
WAVEGUIDE FILTER HAVING SEQUENCE OF THICK CAPACITIVE IRISES

Ralph Levy, Newton, Mass., assignor to Microwave Development Laboratories, Inc., Needham Heights, Mass.

Filed Dec. 26, 1968, Ser. No. 786,967
Int. Cl. H03h *7/10*
U.S. Cl. 333—73 **1 Claim**

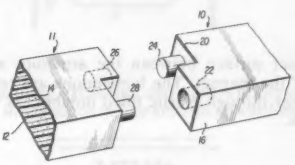


A compact microwave band-pass filter utilizes a sequence of thick capacitive irises stationed along the interior of a waveguide to form a series of directly coupled resonant chambers. The spacing between consecutive irises is $\lambda_g/4$ or less, where λ_g is the upper cutoff frequency of the filter. The close iris spacing causes the second harmonic pass band for the fundamental mode to be far above the main pass band.

3,577,105
METHOD AND APPARATUS FOR JOINING PLATED DIELECTRIC-FORM WAVEGUIDE COMPONENTS

Howard S. Jones, Jr., Washington, D.C., assignor to the United States of America as represented by the Secretary of the Army

Filed May 29, 1969, Ser. No. 828,891
Int. Cl. H01p *1/04, 3/12;* **F16b** *7/00*
U.S. Cl. 333—95 **10 Claims**

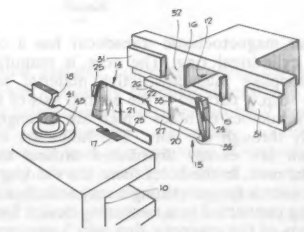


A plated dielectric waveguide component which includes a dielectric foam substrate propagating medium and a thin metallic surface encapsulating the substrate for carrying a conducting current therealong and a method of interconnecting the same. The waveguide component has a quarter wavelength step-shaped end which may be readily butt joined with another plated dielectric waveguide component having a similar construction and matching end whereby a lightweight, sturdy and highly efficient connection is obtained.

3,577,106
ADJUSTABLE IRIS

Leslie Gaza Varhelyi, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed July 14, 1969, Ser. No. 841,693
Int. Cl. H01p *1/00, 5/04;* **F16k** *3/03*
U.S. Cl. 333—98 **5 Claims**



A variable aperture iris located at a waveguide T-junction. Two sliding gates and their related positioning members are of a suitable configuration to form a smooth continuous surface along the waveguide for all sizes of aperture opening.

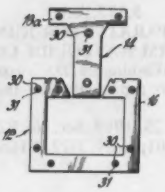
3,577,107
AC OPERATED MAGNET

Gerhard Widl, Ditzingen; Kurt Groetzner, Stuttgart-rot, and Adolf Knodler, Feilbach, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 7, 1969, Ser. No. 797,583
Claims priority, application Germany, Feb. 28, 1968, P 16 39 210.2
Int. Cl. H01l *7/12*
U.S. Cl. 335—248 **7 Claims**

A magnet with laminated core and armature arranged for operation with AC current. A plastic casing surrounds the

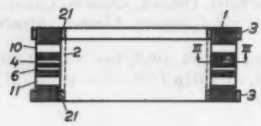
laminated iron in the core and armature members and subdivides the lamination into two identical sections. The intermediate plastic layer which subdivides the lamination serves as an impact surface between the armature and the core member of the magnet. The laminations are reinforced and held together through plastic filled notches, as well as stress takeup rods.



3,577,108
ANNULAR MAGNETOELASTIC TRANSDUCER

Waldemar Bengtson, and Orvar Dahle, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 8, 1969, Ser. No. 855,922
Claims priority, application Sweden, Sept. 10, 1968, 12124/68
Int. Cl. H01f *21/02*
U.S. Cl. 336—20 **2 Claims**



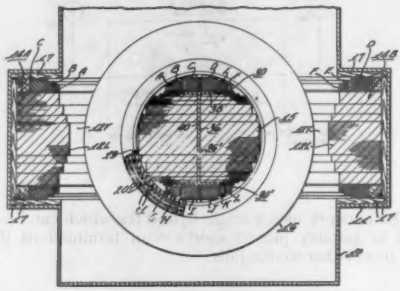
An annular magnetoelastic transducer has a core in the shape of a cylindrical ring. The core is manufactured by winding a striplike magnetostrictive material so that the plane of the strip is parallel to the central axis of the ring. In the core is a number of holes which are arranged substantially radially through the core. The holes are arranged in groups which are evenly distributed around the circumference of the core. In the holes there is a winding connected to a current source for generating a magnetic flux in the core and a winding connected to a measuring device for indicating the alterations of the magnetic flux which appears when the core is subjected to mechanical forces.

3,577,109
MAGNETIC SHIELDING CONSTRUCTION FOR ELECTRIC TRANSFORMERS

Samuel L. Foster, Eagle, Wis., and Reed H. Johnston, Wellesley, Mass., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Sept. 18, 1968, Ser. No. 760,430
Int. Cl. H01f *15/04*
U.S. Cl. 336—84 **13 Claims**

In an electric transformer, magnetic laminations for shielding the main magnetic core from leakage magnetic flux are positioned between the inner periphery of the coil and the portion of the main magnetic core which extends through the coil window. The shield laminations are arranged in closed magnetic loops, with the major surfaces of the shielding laminations lying in planes perpendicular to the major surfaces of the main core laminations, whereby only the edges of the shielding laminations are presented to the leakage magnetic flux, thereby minimizing eddy current losses and consequent overheating of the laminations.



3,577,110
TRANSFORMER HAVING A WOUND CORE AROUND LINEAR CONDUCTORS

Robert L. Arntz, and John R. Marker, Jr., Mansfield, Ohio, assignors to Dominion Electric Corporation, Mansfield, Ohio

Filed May 9, 1969, Ser. No. 823,326
Int. Cl. H01f *17/06*
U.S. Cl. 336—175 **4 Claims**

A transformer having a pair of insulated wires disposed generally adjacent and parallel to each other, one wire being the primary and the other wire being the secondary of the transformer, said insulated wires being wrapped by a film of insulating material. The wrapped wires have a ferrous foil, coated with an insulating film, wrapped in several layers tightly therearound. The assembly of wrapped wires with foil therearound is bound together by a binder. The inner margin of the foil is adhered to the outer margin of the film of insulating material to anchor it and the outer margin of the foil is adhered to the binder. The binder is turned inward at the axially spaced ends of the transformer to protect the foil at those ends. A method of making the transformer is disclosed, including the steps of disposing the insulated wires as stated, wrapping the insulation material therearound, wrapping the foil therearound, and binding the wrapped foil in place.

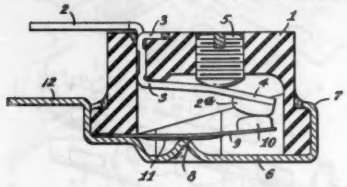
3,577,111
MINIATURIZED SNAP ACTING THERMOSTATIC SWITCH

Antonio Nardulli, Marigliano, Naples, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 2, 1969, Ser. No. 812,699
Claims priority, application Italy, Apr. 3, 1968, 36032A/68
Int. Cl. H01h *37/54*
U.S. Cl. 337—89 **8 Claims**

A miniature thermostatic switch in which a snap acting thermostatic element having a nondevelopable portion

responsible for its snap action is cantilever mounted in a metallic shell. A second mating shell is of electrically insulating material and clamped thereto is an adjustable stationary contact member. In one embodiment the operating temperature of the snap acting thermostatic element is controlled by



eliminating creep action prior to snapping of the element by means of a dimple in the metallic shell which applies a bias to the nondevelopable portion of the thermostatic element. In another embodiment the creep action is avoided by forming the entire thermostatic element in the nondevelopable shape.

3,577,112

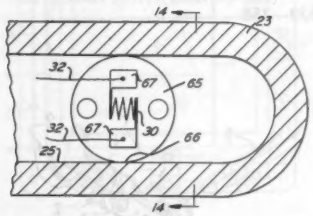
APPARATUS FOR HIGH PRESSURE MEASUREMENT

John C. Bowen, Huntingdon Valley, and Howard G. Fischer, II, Hatboro, Pa., assignors to The Duriron Company, Inc., Dayton, Ohio

Continuation-in-part of application Ser. No. 723,030, Apr. 22, 1968, now abandoned. This application May 22, 1969, Ser. No. 826,892

Int. Cl. G01l *1/22*

U.S. Cl. 338—4 **18 Claims**



Apparatus for high pressure measurement utilizing strain gages removably mounted in an opening in an object to which a force, such as fluid pressure, is applied. The mounting is separated from the location of application of the high pressure. The strain gages are carried on plates or the like or may comprise plates, for ready insertion and removal.

3,577,113

ELECTRONICS CARD EXTRACTOR

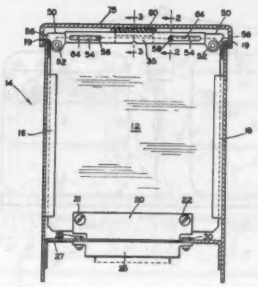
Robert Thomas Maitland, Franklin Lakes, N.J., assignor to The Bendix Corporation

Filed Oct. 2, 1969, Ser. No. 764,483

Int. Cl. H01r *13/62;* **H05k** *5/02*

U.S. Cl. 339—17 **4 Claims**

An electronics card extractor utilized in the insertion and extraction of circuit cards from a card holder or electronics box having guiding elements or card slides secured at opposite sides of the box and extractors pivotally mounted at opposite outer corners of the card, the extractor being operative by a handle to cause projecting end portions of both extractors to simultaneously bear upon opposite reinforced upper edge portions of the card holder which in effect become fulcrums about which the force applied to the handle may initially provide an extraction force to effect a full disengagement of a card connector at a lower edge of the card from a connector mounted on the lower surface of the box, and thereafter upon the operator continuing to raise the handle the extractors then function to withdraw the card from



the card holder, the extracting and card withdrawing forces being applied in sequence in one smooth upward motion.

3,577,114

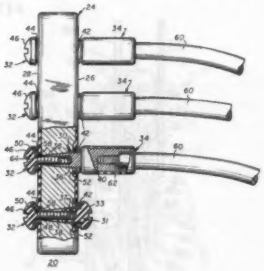
CONNECTING DEVICE

William M. Hawkins, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Dec. 12, 1969, Ser. No. 884,564

Int. Cl. H01r *13/52,* **H01r** *7/06*

U.S. Cl. 339—94 **22 Claims**



An insulated, sealable, connecting device for mechanically and electrically releasably coupling at least two conductors to provide a substantially watertight assembly, comprising, in combination, an insulated, electrically conductive body member having at least two apertures therethrough, at least two selectively bored, partially insulated, conductor-receiving stubs adapted to be releasably engaged therein, at least two threaded fastening means adapted to releasably couple an associated stub within the apertured conductive body member, and at least two first and at least two second resilient sealing means to provide sealing engagement between, respectively, the conductive body member and an associated stub, and the conductive body member and an associated fastening means.

3,577,115

ELECTRICAL CONNECTOR STORING DEVICE FOR MOTOR VEHICLE TRAILERS

Joseph W. E. Whitright, Cheshire, Conn., assignor to Cheshire Manufacturing Co., Inc., Cheshire, Conn.

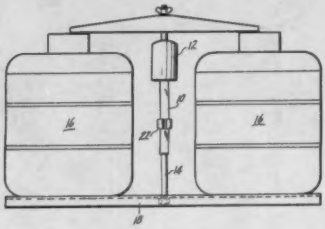
Continuation-in-part of application Ser. No. 706,305, Feb. 19, 1968, now abandoned. This application Oct. 17, 1969, Ser. No. 867,342

Int. Cl. H01r *13/44, 13/52;* **A44b** *21/00*

U.S. Cl. 339—36 **2 Claims**

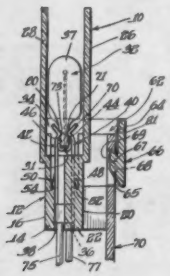
A device for storing and protecting an electrical plug on a trailer when disconnected from the motor vehicle by which

the trailer is drawn, in which an inverted hood is provided on a mounting channel that is attached to a fixed portion of the trailer. The hood is attached to the mounting channel by



simply inserting its wall into slots in the upper end of the channel, these slots being positioned so that the wall of the hood is gripped tightly between the flanges on one side and the web of the channel on the other.

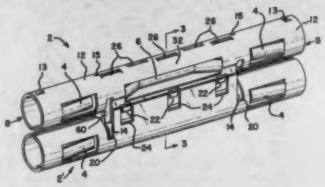
3,577,116
LAMP SOCKET AND TERMINAL
Bruno Baumanis, River Forest, Ill., assignor to Molex, Incorporated, Downers Grove, Ill.
Filed Aug. 8, 1968, Ser. No. 751,079
Int. Cl. H01r *13/60*
U.S. Cl. 339—125 **6 Claims**



A lamp socket for receiving an easily replaceable lamp bulb, comprising a plastic housing having a pair of opposing terminals extending therethrough for receiving the base of the lamp bulb therebetween to make both mechanical and electrical contact therewith, and mounting means integrally formed with a sidewall of the housing for snapping the lamp socket onto a mounting tab extending from a panel. A first embodiment of mounting means includes a resilient arm having a lock tab at the free end thereof for insertion into an aperture in the panel mounting tab, and a second embodiment includes a pair of opposing arms and a nib extending therebetween from one wall of the housing. The arms hold the panel tab against the housing wall and the nib is received in the aperture of the panel tab to retain the socket on the panel.

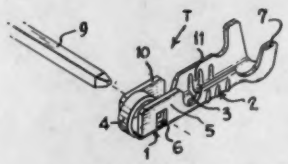
3,577,117
ELECTRICAL CONNECTOR
Harold Louis Bruetsch, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 24, 1969, Ser. No. 801,473
Int. Cl. H01r *13/12*
U.S. Cl. 339—248 **3 Claims**

This invention relates to a cylindrical wire splice having an internal metallic connector portion formed by rolling multiple precut metal strip, and an insulating cover rolled about the connector portion to insulate the electrical contact of the connector portion from points external of the device. The ends of the wires to be spliced have a radially enlarged collar which is engaged by oppositely directed tines of the connector portion to position the ends of the wire within the device. Cantilever surfaces at the center of the connector portion rigidly grip the ends of the wire to form a proper electrical contact therebetween. The ends of the insulating cover have



resilient plug members which are inserted therein to seal the wires both before and after insertion into the device. The plug members have an opening to allow the insertion of the wires therein, and a portion of the plug member extends across the opening to seal the interior of the connector portion prior to the insertion of wires in the device.

3,577,118
ELECTRICAL TERMINAL
Geroge Sylvester Reider, Highspire, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of application Ser. No. 669,551, Sept. 21, 1967.
This application Apr. 23, 1969, Ser. No. 869,405
Int. Cl. H01r *11/08*, **H01r** *11/22*
U.S. Cl. 339—258 **4 Claims**

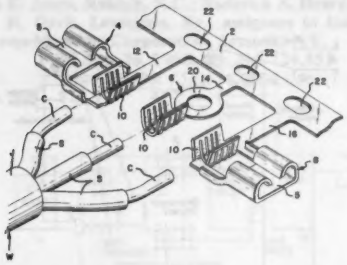


A detachable flag-type terminal which may be stacked on a post is disclosed. The terminal is generally U-shaped in cross section. The web is extended and arched rearwardly to form a spring means which acts as a post-holding means. Openings are formed in the sidewalls of the web. The openings are aligned thereby creating a passage through which a post may be inserted in a direction normal to the axis of the ferrule of the terminal.

3,577,119
ELECTRICAL CONNECTORS ON A CARRIER STRIP
Armand Rene Delyon, Harrisburg, and Lex Donald Kensinger, Hershey, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed June 4, 1969, Ser. No. 830,357
Int. Cl. H01r *11/08*
U.S. Cl. 339—276 **5 Claims**

Plural different electrical connectors are provided on a common carrier strip so that each conductor of a multiconductor wire may have a specific connector secured or terminated thereto. The resulting terminated conductors are particularly useful in e.g., automobile wiring harnesses. The strip is adapted to be fed into automatic crimping presses

wherein one set of crimping dies is used to crimp all of the connectors on the strip. Connectors are severed from the



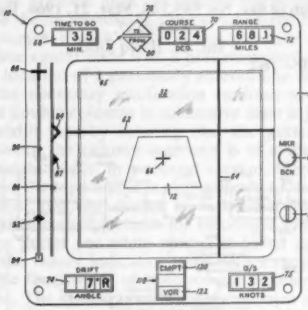
carrier strip when they are crimped onto the conductors of the multiconductor wires.

3,577,120

DISPLAY SYSTEM FOR USE IN VTOL-TYPE AIRCRAFT

Archie T. Sherbert, Jr., Media, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 14, 1968, Ser. No. 767,182
Int. Cl. B64d *45/04*
U.S. Cl. 340—27 **15 Claims**



A system for displaying information relating to the operation of a vehicle, such as an aircraft. An integrated approach/hover indicator provides a pictorial representation of an intended landing site for the aircraft and indicates the position of the aircraft relative to the landing site and relative to a preselected path leading to the landing site. The pictorial representation is displayed in proper perspective such that a pilot viewing the instrument would think he is actually viewing the landing site. In addition, the instrument provides digital readout and other devices which visually display a number of operating values relating to the performance of the aircraft.

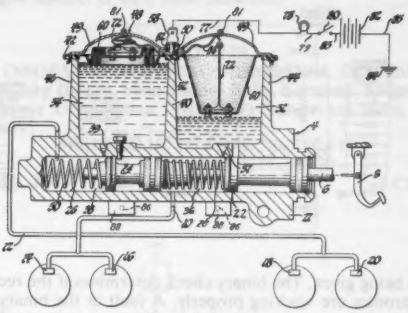
3,577,121

BRAKE FLUID LEVEL SWITCH

Douglas J. Wing, St. Clair Shores, and William A. Ramey, Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1969, Ser. No. 875,080
Int. Cl. B60q *1/00*
U.S. Cl. 340—59 **6 Claims**

A vehicle brake master cylinder assembly of the dual reservoir type including a fluid level responsive diaphragm positioned in each of the reservoirs. Each diaphragm supports a flexible insulator member which in an acceptable fluid level position is placed between a resilient spring-biased contact member and an electrically grounded reservoir cover maintaining a signal circuit therebetween open. Should the level of fluid in a reservoir decrease to a predetermined minimum level, its resilient insulator is pulled from between one of the spring-biased contacts and the reservoir cover closing the circuit to the signalling device, thereby informing the operator of the low fluid condition. Removal of the reservoir cover



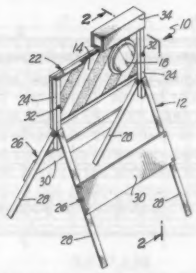
and filling of the reservoir raises the diaphragm to its uppermost position, but does not again open the signal circuit until the attendant performs the positive act of placing the insulator member between the spring-biased contact and the cover.

3,577,122

FLAT PANEL TRAFFIC WARNING SIGN HAVING LIGHT MOUNTED THEREON

James O. Lapham, 308 N. Westridge Ave., Covina, Calif.

Filed Jan. 9, 1969, Ser. No. 790,032
Int. Cl. G08b *5/36*, **G08b** *5/38*
U.S. Cl. 340—114 **2 Claims**



A traffic warning sign having a flasher mounted within an opening in a panel of the sign so as to be visible from either side of the panel and connected to a flasher circuit and battery by leads contained within a concealed passageway or groove in the panel. One disclosed embodiment of the invention is a street barricade in which the flasher circuit and battery are contained within a housing which also tends to shield the lenses of the flasher lamp. A second disclosed embodiment is a traffic lane divider.

3,577,123

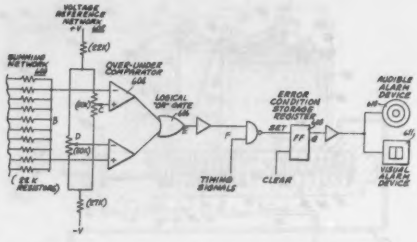
METER READING SYSTEM

James R. Taylor, Allendale, N.J., and Thomas C. Clements, New York, N.Y., assignors to Neptune Meter Company, New York, N.Y.

Filed May 31, 1968, Ser. No. 733,372
Int. Cl. G01d *3/08*; **G11b** *27/36*; **H03k** *13/34*
U.S. Cl. 340—146.1 **9 Claims**

In a system for reading meter registers and the like, special error detecting circuits are provided in the meter reading and recording apparatus forming part of the system. For every character recorded two error checks are performed, one at the decimal level, and a further one at the binary level. The decimal check determines if there are any errors that have been introduced due to faults anywhere in the decimal por-

tion of the system, including the entire house installation. Such errors might arise, for example, due to open or short circuits within such installation. A fault at the decimal level will result in a "no digit/multidigit" or "house error" indication being given. The binary check determines if the recorder electronics are working properly. A fault at the binary level will result in an incorrect parity indication, or "recorder error" being given.

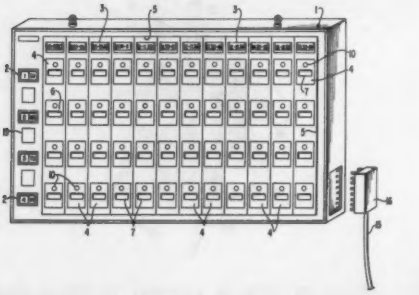


3,577,124

PRE-ENGAGEMENT CARD CONTROLLED PATIENTS

Tadataka Kobayashi, Kyoto Prefecture, Japan, assignor to Iwao Ueda, Kyoto, Japan

Filed July 24, 1969, Ser. No. 844,265
Claims priority, application Japan, July 25, 1968, 43/52808
Int. Cl. H04q *3/00*, H04q *5/00*
U.S. Cl. 340—153 **10 Claims**



Appointment selection device formed by a plurality of card holding compartments arranged in rows and columns. The rows designate days and the columns designating time periods within a day, the compartments including adjustable means for regulating the size thereof thereby permitting introduction of no more than a prescribed number of cards in a given compartment. Indicating means is provided for indicating when a compartment contains a prescribed number of cards.

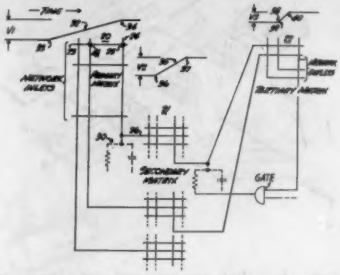
3,577,125

MONOLITHIC ELECTRONIC SWITCHING NETWORK HAVING VARIABLE VOLTAGE LEVELS

Jack G. Frisbie, Great Falls, Va., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Oct. 16, 1968, Ser. No. 767,973
Int. Cl. H04q *1/00*
U.S. Cl. 340—166 **9 Claims**

The invention relates to a solid state switching matrix, a plurality of which may be cascaded to provide a switching network. Various means are disclosed for controlling the amount of energy required to fire a diode in one matrix and the amount of energy passing through the diode after it has fired. By the selection of proper characteristics, the diodes in each state may be made to fire on less energy than was required to fire the diodes in the next preceding state. This way, the diodes may be made to scan idle points in the network without causing offensive levels of fan-out current to build up.

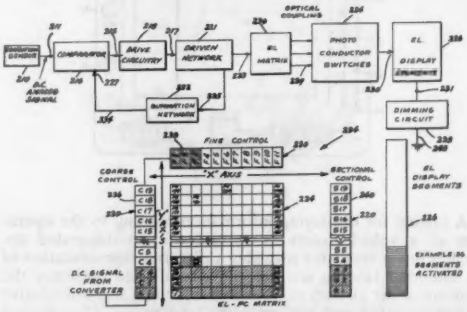


3,577,126

PULSE RESPONSIVE CONTROL NETWORK

Robert J. Molnar, New York, N.Y., and Walter Parfomak, Wallington, N.J., assignors to The Bendix Corporation

Filed Sept. 11, 1968, Ser. No. 758,946
Division of Ser. No. 535,745, Mar. 21, 1966, Pat. No. 3,440,637.
Int. Cl. H04q *3/00*
U.S. Cl. 340—167 **31 Claims**

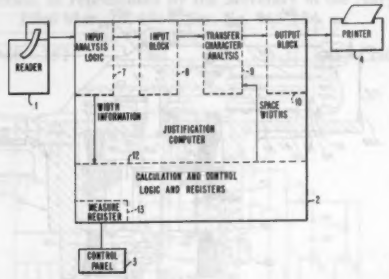


A pulse responsive control network including a first and second plurality of control devices sequentially operated by electrical signal pulses of one sense for effecting control functions, together with first and second means operable respectively in response to initial sequential operation of a last of said first and second plurality of control devices for providing clearing pulses of another sense to condition other of the respective first and second plurality of control devices for sequential reoperation to effect a multiplexing action, together with switching means effective upon completion of the reoperation of the other of said first plurality of control devices to condition the second plurality of control devices for sequential operation by the electrical signal pulses of said one sense; and other means to effect electrical signal pulses of said other sense to selectively terminate the operation of the first and second plurality of control devices, said last mentioned means including a time delay means to cause the signal pulses of said other sense to terminate the operation of said second plurality of control devices after termination of the operation of the first plurality of control devices has been effected.

3,577,127
COMPOSER SYSTEM FOR PROCESSING DATA IN PARALLEL COLUMNS

David Bishop, Austin; David W. Terry, Georgetown, Tex.; John E. Jones, Raleigh, N.C.; Roderick S. Heard, and William H. Davis, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1968, Ser. No. 724,552
Int. Cl. G06f *15/06*; G06f *15/46*
U.S. Cl. 340—172.5 35 Claims

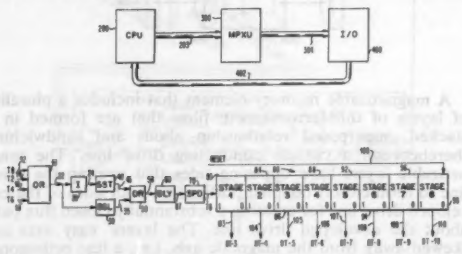


The invention concerns composing systems including techniques and apparatus for achieving justification of columnar data. In one version, Method A, the system derives columnar data from a source media, such as the familiar "-Presswire" paper tape having pairs of text columns arranged in successive justified lines, recognizes the occurrence of a code in the media identifying the center of the line between the two columns, if such occurs within a certain range, compares the line center code with a predetermined range about the center location of a previously entered line measure, and develops the necessary justification routines to insure that each of the double columns in successive lines is justified to a standard width thereby insuring that the gutter (or white space) between the column segments is of a uniform width and has straight edges. In a second version, Method B, data derived from the tape media is also scanned to determine the occurrence of the line center in successive lines, but the necessary justification routines for insuring a uniform placement of the gutter (or white space) is based upon a comparison of the center indicating code with a range about the center of the fixed width of both column segments in an individual line. The system readily accommodates a number of column segments greater than two in individual lines and column segments that differ in width. Also, it is receptive to input data derived from sources other than a paper tape media, and the output of the system, rather than being a printer, as described herein, can be any one of a number of composing entities, recording units, communicating units, or the like.

3,577,128
SYNCHRONIZING CLOCK SYSTEM

Tony N. Criscimagna, Woodstock, and Robert J. Fournier, Staatsburg, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1969, Ser. No. 790,952
Int. Cl. H03k *3/64*
U.S. Cl. 340—172.5 3 Claims

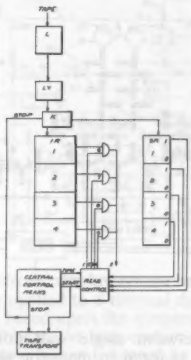


In a data processing system, apparatus for synchronizing a slave clock in an input/output device with a master clock in a central processing unit. A set of clock signals from a CPU are received in parallel, converted to serial and pulses are generated in response to the leading and trailing edge of each of the series of signals. The series of pulses is then delayed and shaped to drive a slaved I/O clock. A delay line is adjusted so that the total equivalent system delay is equal to an integral number of CPU pulse durations.

3,577,129
INFORMATION READ-OUT CONTROL SYSTEM

Klaus Jorg Hecker, Main-Taunus Kreis, Germany, assignor to Eichner Organisation GM/BH, Frankfurt Am Main, Germany

Filed Sept. 18, 1968, Ser. No. 760,616
Int. Cl. G11b *19/00*; G11c *19/00*
U.S. Cl. 340—172.5 6 Claims

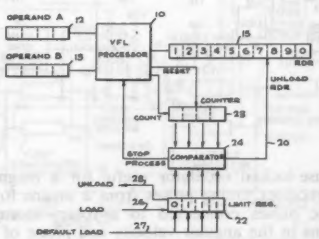


A tape transport requires a predetermined time period for stopping after receipt of a stop signal. During this predetermined time period the information items from the tape are stored in a shift register. A second shift register with the same number of stages as the first shift register generates a signal from each stage corresponding to a stage in the first shift register wherein an information item was stored. When the tape transport is restarted the information from the first shift register is read out under control of timing signals and signals from the second shift register.

3,577,130
MEANS FOR LIMITING FIELD LENGTH OF COMPUTED DATA

Rex Rice, Menlo Park; Gilman D. Chesley, Los Altos, and William R. Smith, Mountain View, Calif., assignors to Fairchild Camera and Instrument Corporation, Mt. View, Calif.

Filed Oct. 3, 1969, Ser. No. 863,454
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 2 Claims



Limit hardware for controlling the field length of resultant data produced by a data processor including a limit register, a counter and a comparator. The limit register is loaded with

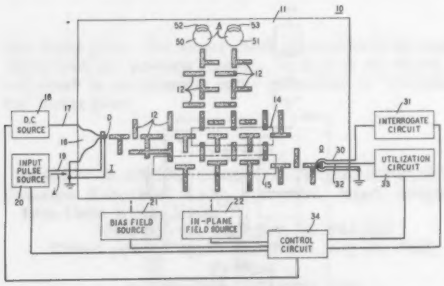
any desired number representing the desired number of fields of the resultant data, while the counter is incremented as each field of resultant data is produced by the processor. When the contents of the limit register and the counter are equal, data processing is terminated and the desired number of resultant data produced by the processor is supplied to any appropriate user, before a new processing operation is initiated.

3,577,131

DOMAIN PROPAGATION ARRANGEMENT

Robert H. Morrow, Lebanon Township, Hunterdon County, and Anthony J. Perneski, Martinsville, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 30, 1969, Ser. No. 795,148
Int. Cl. G11c *19/00*; G11c *11/14*
U.S. Cl. 340—174 **14 Claims**



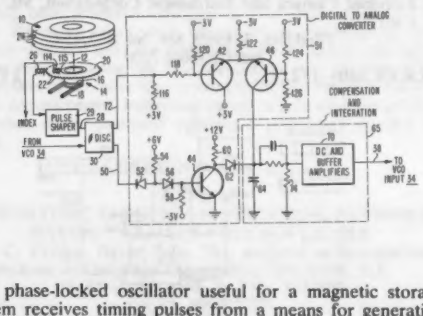
Interactions between single wall domains permit logic operations to be realized in magnetic sheets in which such domains are moved. Magnetically soft overlay patterns not only define propagation channels for such domains in response to magnetic fields reorienting in the plane of the sheet but also define channel intersections where logic functions are carried out. Domains are idled or, alternatively, in direction at those intersections depending on the positions of preceding domains. A variety of counter circuits are described.

3,577,132

PHASE LOCKED OSCILLATOR FOR STORAGE APPARATUS

Donald E. Anderson; Lawrence M. Koch; Robert E. Lloyd, and Frank J. Sordello, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 6, 1968, Ser. No. 735,137
Int. Cl. G11b *5/44*; G11b *19/28*; G11b *27/10*
U.S. Cl. 340—174.1A **9 Claims**



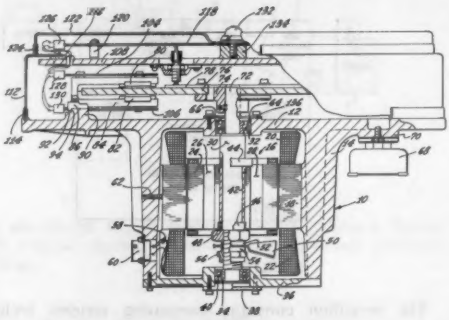
A phase-locked oscillator useful for a magnetic storage system receives timing pulses from a means for generating reference pulses connected to a rotary storage medium. Variations in the angular velocity and phase of the rotating storage medium result in corresponding variations of frequency and phase of a voltage-controlled oscillator, which controls the write or record circuitry. During readout, the phase-locked oscillator is employed to locate the selected data records accurately.

3,577,133

DISC MEMORY SYSTEM INCLUDING UNITARY SUPPORT MEMBER AND PRINTED CIRCUIT BOARD

Allen E. Garfein, Woodland Hills, and Irwin B. Garfein, Los Angeles, Calif., assignors to Engineered Data Peripherals Corporation, Santa Monica, Calif.

Filed Nov. 19, 1968, Ser. No. 776,936
Int. Cl. G11b *5/48*
U.S. Cl. 340—174.1 **16 Claims**



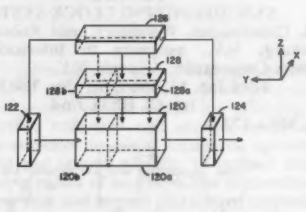
The present invention is directed to a disc memory system which includes a magnetic memory disc and the companion electronics for recording and reading out the information on the memory disc and wherein the bulk of the electronics is located on a single printed circuit board mounted adjacent to and in a parallel plane to the plane of the memory disc. All of the electronics except the diode boards are on this single printed circuit board. A single unitary casting supports all of the major components of the disc memory system such as the motor, shaft, magnetic heads, etc., and all of the major tolerances which must be maintained in order to insure the proper function of the interrelated parts of the disc memory system are held on this single casting. The memory disc is maintained in a first sealed compartment which is supported on the single casting and the single printed circuit board is maintained in a second sealed compartment separate from the first sealed compartment.

3,577,134

METHOD OF OPERATING A CONVERTIBLE MEMORY SYSTEM

Robert J. Bergman, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

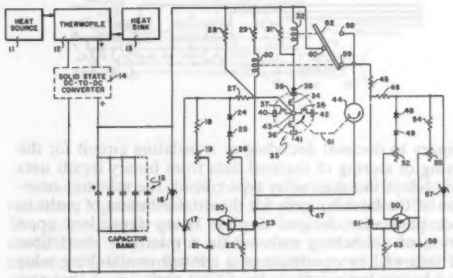
Filed Sept. 16, 1969, Ser. No. 858,372
Division of Ser. No. 671,026, Sept. 27, 1967, Pat. No. 3,480,929.
Int. Cl. G11c *11/14*, G11c *5/02*
U.S. Cl. 340—174 **8 Claims**



A magnetizable memory element that includes a plurality of layers of thin-ferromagnetic-films that are formed in a stacked, superposed relationship about and sandwiching therebetween a current conducting drive line. The magnetizable layers have opposing sides that overlap the drive line to form closely coupled portions on both sides of the enveloped drive line for creating a substantially closed flux path about the enveloped drive line. The layers' easy axes are skewed away from the magnetic axis, i.e., a line orthogonal to the longitudinal axis, of the enveloped drive line providing single-domain rotational switching of the layers' magnetization during both the write and read operations. Pairs of layers

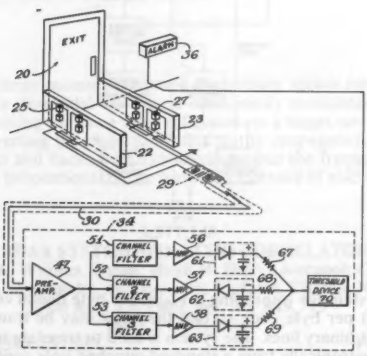
on each side of the enveloped drive line are comprised of layers of relatively high and low H_k characteristics whereby an energized enveloped drive line substantially effects only the low H_k layers upon readout providing nondestructive readout of the information stored in the high H_k layers.

3,577,135
UNATTENDED FLASHING NAVIGATION BEACON SYSTEM
Donald B. Steen, Baltimore, Md., assignor to the United States of America, as represented by the Secretary of the Navy
Filed Mar. 26, 1968, Ser. No. 716,154
Int. Cl. H05b *41/46*
U.S. Cl. 340—251 **11 Claims**



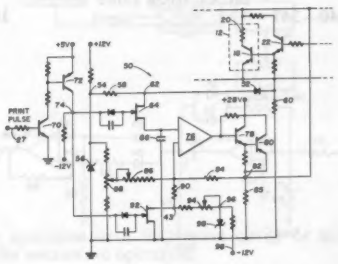
An unattended flashing navigation beacon system comprising a solid-state thermoelectric generator to supply power to the system, a Zener voltage limiter to regulate the system voltage, a capacitor bank to store power supply energy during eclipse time, a solid-state flasher, a motorized lamp changer, a first time delay circuit means for controlling the amount of time said flasher is actuated and a second time delay circuit means for controlling the amount of time said flasher is eclipsed. The flasher and lamp changer are interconnected such that a relay is activated when a lamp burns out. The relay initiates operation of the lamp changer motor and simultaneously prevents the flasher from switching to the eclipse state until a new lamp bulb is placed into position at which time the relay turns off the motor and allows the flasher to resume operation.

3,577,136
SHORT-RANGE SIGNALING SYSTEM
John E. Wolf, Marengo, Ill., assignor to Security Systems, Inc.
Filed Aug. 4, 1967, Ser. No. 658,491
Int. Cl. G08b *13/24*; **H03b** *5/30*
U.S. Cl. 340—280 **15 Claims**



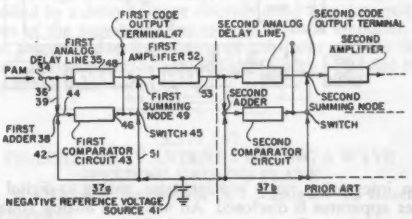
A merchandise protection system in which an encapsulated, magnetically latched reed is hidden on the article to be protected against theft. Magnets placed adjacent an exitway from the protected enclosure release the reed, allowing it to thereafter vibrate at a predetermined frequency. The reed produces a magnetic disturbance which is detected by a sensitive, frequency-selective pickup device which, in turn, actuates an alarm.

3,577,137
TEMPERATURE COMPENSATED ELECTRONIC DISPLAY
James Brennan, Jr., Houston, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.
Filed Dec. 31, 1968, Ser. No. 788,178
Int. Cl. H04l *15/34*
U.S. Cl. 340—324 **20 Claims**



A high speed electronic display system having a circuit for adjusting the power applied to a thermal display matrix during a printing cycle based upon the temperature of the print head. In one embodiment, the temperature of a matrix of air isolated semiconductor means is sensed by a diode diffused in an adjacently mounted integrated circuit immediately prior to the print cycle, and the power applied to drive the matrix during the print cycle is adjusted in accordance with the offset voltage across the diode. In another embodiment, the temperature of the matrix of elements is estimated using a temperature sensing element located on the heat sink and correcting the sensed temperature to compensate for the repetition rate of the print cycle, the number of elements activated during each print cycle, the rate at which heat is transferred to the heat sensing element, and the rate at which heat is dissipated from the heat sensing element. There is a single sensor for the thermal display matrix.

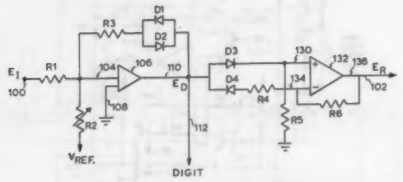
3,577,138
FEEDBACK TYPE PULSE AMPLITUDE MODULATION CODING SYSTEM
Masao Kawashima; Shunroku Sasaki, Yokohama-shi, and Syoichi Kurita, Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki-shi, Japan
Filed Dec. 13, 1966, Ser. No. 601,467
Claims priority, application Japan, Dec. 16, 1965, 40/77471
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **8 Claims**



A pulse amplitude modulated signal is held in a first holding circuit and is supplied to a summing node via a switch. A reference signal from a reference signal source is also sup-

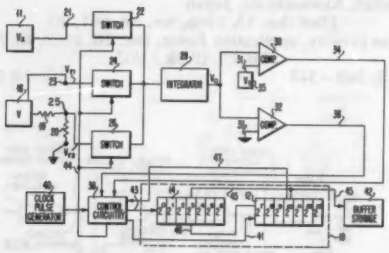
plied to the summing node which provides a difference signal indicative of the difference in amplitude between the pulse amplitude modulated signal and the reference signal. An amplifier amplifies the difference signal and a comparator determines the polarity of the difference signal and provides a corresponding binary output signal. The comparator is also connected to the reference signal source in a first feedback path. A second holding circuit is connected in a second feedback path between the amplifier and the switch and the amplified difference signal is supplied to the summing node via the switch in selective alternation with the pulse signal.

3,577,139
ANALOG-TO-DIGITAL CONVERTER
Roy P. Foerster, Thousand Oaks, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.
Filed June 12, 1967, Ser. No. 645,191
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **10 Claims**



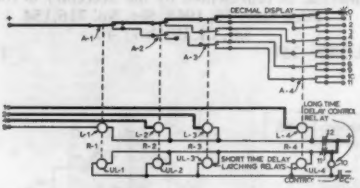
A converter responsive to analog input signals for providing "reflected binary" or Gray code output signals. The converter is comprised of a plurality of substantially identical stages connected in cascade. Each stage provides both a digital output signal and a residual analog output signal in response to an analog input signal applied thereto. The level of the residual output signal provided by each stage is determined by a V-shaped transfer characteristic defined by a differential amplifier therein. The residual output signal from each stage constitutes the input signal to a subsequent stage.

3,577,140
TRIPLE INTEGRATING RAMP ANALOG-TO-DIGITAL CONVERTER
Hans Bent Aasnaes, Trondheim, Norway, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 27, 1967, Ser. No. 649,161
Int. Cl. H03k *13/02*; H03k *13/20*
U.S. Cl. 340—347 **14 Claims**



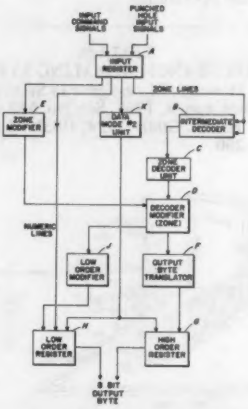
An integrating ramp voltage type analog-to-digital converter apparatus is disclosed. An unknown analog voltage is integrated for a fixed time period. During subsequent, successive integration of reference voltages, pulses are gated into a partitioned counter, filling the higher order positions in that counter first. The counter then contains a digital representation analog the analog voltage.

3,577,141
BINARY TO DECIMAL TREE RELAY DECODER CIRCUIT WITH MEMORY DISPLAY
Eusebio V. Quintero, Greenville, S.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.
Filed Nov. 14, 1968, Ser. No. 775,737
Int. Cl. G06f *5/00*
U.S. Cl. 340—347 **4 Claims**



A binary to decimal decoding or translating circuit for the displaying or storing of decimal data from binary inputs uses latching relays in a tree relay type circuit, the selective energization of the latching coils for the establishment of paths to produce particular decimal displays being dependent upon operation of unlatching coils within a relatively short time period followed by operation of a control nonlatching relay within a longer but relatively brief time period such that new binary data may be fed into or removed from the circuit while previously fed binary data is held displayed or stored in memory.

3,577,142
CODE TRANSLATION SYSTEM
John V. McMillin, Iowa City, Iowa, assignor to Westinghouse Learning Corporation
Filed Feb. 28, 1969, Ser. No. 803,160
Int. Cl. H03k *13/24*; H04i *3/00*; G06f *5/02*
U.S. Cl. 340—347DD **11 Claims**



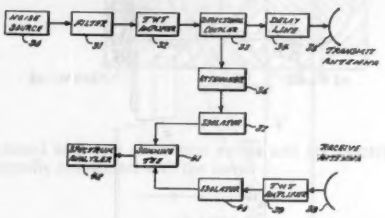
A system for translating a 12-bit per byte digital code into an 8-bit per byte code so that the latter may be transmitted on 8-bit binary lines. The system is used to translate information electronically from a standard punched-hole card, which is normally in a 12-row, 80-column format, into an extended binary-coded decimal interchange code that can be more easily transmitted between computer channels and other devices such as card readers and punches.

3,577,143

EXTENDED RANGE SPECTRUM ANALYSIS RADAR

Joseph L. Poirier, 26 Brian Road, and John K. Schindler, 6 Nevada Drive, Chelmsford, Mass.

Filed Apr. 8, 1969, Ser. No. 814,334
Int. Cl. G01s 9/24
U.S. Cl. 343—12R 13 Claims



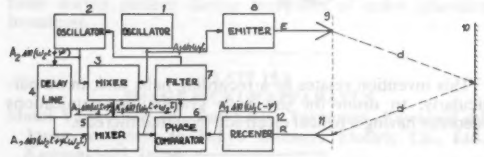
A radar system in which the return signal is added to a reference signal derived from the original transmitted signal. The power spectrum of the sum signal is modulated. The modulation frequency is a linear function of the range and is measured to determine the range to the target. To extend the maximum range of the system the reference signal is delayed relative to the received signal, and to decrease the minimum range the received signal is delayed relative to the reference signal.

3,577,144

DISTANCE MEASURING SYSTEMS

Pierre Girault, Paris, France, assignor to CSF Campagnie General De Telegraphie Sans Fil

Filed Oct. 10, 1968, Ser. No. 766,559
Claims priority, application France, Oct. 31, 1967, 126.610
Int. Cl. G01s 9/23
U.S. Cl. 343—14 4 Claims



A distance measuring system comprising means for transmitting a sinusoidal wave or a sinusoidally modulated wave and receiving the same after reflection on a target and means for converting the phase shift, due to the propagation of this wave out and back, into a measuring signal the frequency of which is proportional to the travelling distance of said wave.

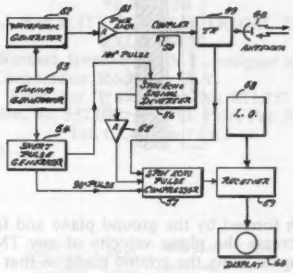
3,577,145

RADAR SYSTEM SPIN ECHO CORRELATOR

Robert A. Worden, Eaton; Hugh H. Hair, Liverpool; Carl W. Gerst, Skaneateles, and Benadict Viglietta, Clinton, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,719
Int. Cl. G01s 9/24
U.S. Cl. 343—17.2PC 4 Claims

The spin properties of paramagnetic materials are utilized to provide a correlator of radar signals. Paramagnetic materials having an in homogeneous resonance line and relatively long spin-spin and spin-lattice relaxation times such as phosphorous-doped silicon are placed into a coupling structure which couples RF energy to the magnetic spin system. Such a structure can be a simple tuned LC oscillator for low-



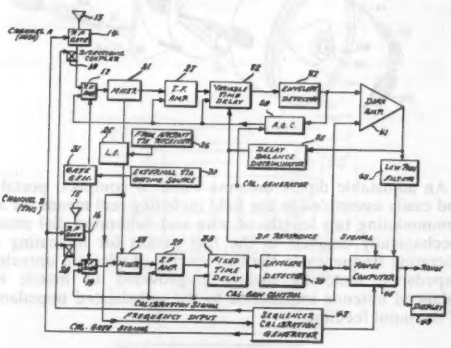
frequency operation or a microwave cavity or slow wave structure for microwave operation.

3,577,146

PASSIVE MONOPULSE RANGING SYSTEM

Michael Freier, and Leonard P. Balazer, Sunnyvale, Calif.

Filed Apr. 16, 1969, Ser. No. 817,616
Int. Cl. G01s 5/14; G01s 11/00
U.S. Cl. 343—112 3 Claims



A monopulse ranging system where incoming signals from two antennas are converted to an intermediate frequency and passed through corrective delays with one of the delays being controlled by a delay balance discriminator. The detected envelopes of the signals are fed to a differential amplifier, the output thereof being fed to a range computer and the delay balance discriminator detects the differences to be fed back to one of the delay controls.

3,577,147

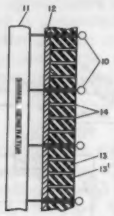
PHASED ARRAY ANTENNA HAVING A WAVE SPEEDING GROUND PLANE

Peter W. Hannan, Smithtown, N.Y., assignor to Hazeltine Corporation

Filed Sept. 8, 1969, Ser. No. 855,900
Int. Cl. H01q 13/00
U.S. Cl. 343—778 13 Claims

A phased array antenna consisting of a plurality of radiating elements associated with a ground plane and including a

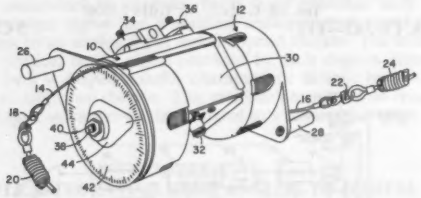
reactive impedance for reducing the catastrophic effect produced by end-fire grating lobes and surface waves. A series capacitance or shunt inductance is placed in the transmission path formed by the ground plane and free space in order to increase the phase velocity of any TM wave that might propagate along the ground plane so that it is at least equal to the phase velocity of a free space wave.



3,577,148
PORTABLE REELABLE DIPOLE ANTENNA HAVING FREQUENCY CALIBRATED DIAL

Donald L. Holzschuh, Richardson, and Betty M. Wicker, Richardson, Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed Nov. 6, 1968, Ser. No. 773,826
Int. Cl. H01q *9/16*
U.S. Cl. 343—821 **1 Claim**



An adjustable dipole antenna which is compact, portable and easily assembled in the field including reel means for accommodating two lengths of wire and calibrated dial means mechanically coupled to the reel means for indicating an operating frequency as the two lengths of wire are unreeled. Impedance matching means is provided to match the balanced antenna impedance to the unbalanced impedance of the input feedline.

ERRATUM

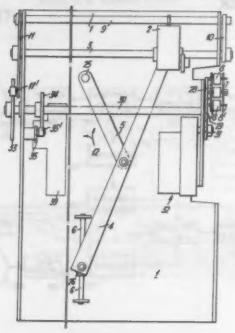
For Class 346—46 see:
Patent No. 3,577,131

3,577,149
COLOR PRINTING APPARATUS FOR POTENTIOMETRIC RECORDING INSTRUMENTS

Ugo Carpino, Milan, Italy, assignor to Pio Guardigli, Milan, Italy

Filed Nov. 15, 1968, Ser. No. 776,044
Claims priority, application Italy, Nov. 20, 1967, 22899/67
Int. Cl. G01d *9/34*
U.S. Cl. 346—46 **6 Claims**

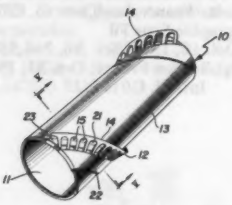
Writing apparatus in multicurve electronic potentiometric recording instruments to record the values of a plurality of variables on a continuous movement single chart. The writing apparatus comprises a movable writing carriage, means for inking in a plurality of colours and changeover means for selecting the variables. The writing carriage moves parallel to itself to assume the stamping and inking position and oscillates at right angles to the direction of movement to effect the stamping and inking operations.



3,577,150
RECORDING HELIX

Milton Alden, Needham, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Filed Jan. 22, 1969, Ser. No. 793,132
Int. Cl. G01d *15/06*
U.S. Cl. 346—139 **11 Claims**



This invention relates to a recording helix and, more particularly, to drum for use in a graphic communications recorder having a helical electrode mounted thereon.

ERRATA

For Classes 174—128 thru 346—75 see:
Patent Nos. 3,577,151 thru 3,577,198

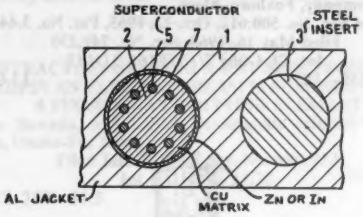
3,577,151
FULLY OR PARTLY STABILIZED CONDUCTOR COMPRISED OF SUPERCONDUCTING AND NORMAL-CONDUCTING METALS

Gunther Bogner, Tennenlohe, and Richard Maier, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Apr. 1, 1969, Ser. No. 812,040
Claims priority, application Germany, Apr. 6, 1968, P 17 65 132.0
Int. Cl. H01v *11/04;* **H01f** *7/22*
U.S. Cl. 174—128 **11 Claims**

Described is a fully or partly stabilized conductor combined of superconducting and normal-conducting metals. The conductor is characterized in that several superconductors with small cross section are combined with a copper matrix to form a multicore conductor. The superconductors

are completely embedded in the copper matrix and in metallurgical connection therewith. Several multiconductors are



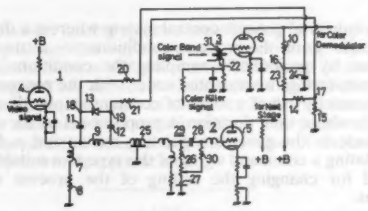
enclosed with one aluminum jacket and are electrically and thermally connected with the same.

3,577,152

ARRANGEMENT FOR COLOR TELEVISION RECEIVER

Koichi Yahagi, Kawasaki-shi, Japan, assignor to Nippon Columbia Company, Limited

Continuation-in-part of application Ser. No. 760,603, Sept. 18, 1968. This application June 10, 1969, Ser. No. 834,220
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 11 Claims



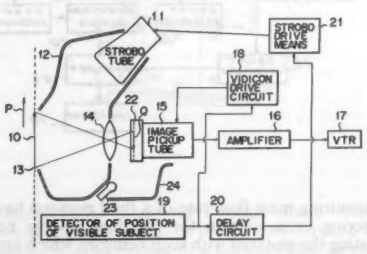
A video amplifier circuit arrangement for a color television receiver which is capable of effectively meeting a contradictory relationship between the production of a picture with high resolution during reception of black-and-white television broadcast and the production of a color picture free from dotted pattern during reception of color television broadcast.

3,577,153

IMAGE PICKUP APPARATUS

Motoi Yagi, Zushi-shi, and Yasuo Takemura, Kawasaki-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 19, 1968, Ser. No. 753,638
Claims priority, application Japan, Aug. 23, 1967, Jan. 18, 1968, 42/53768; 42/53767; 42/71998; 43/2337
Int. Cl. H04n *7/18, 5/30*
U.S. Cl. 178—7.2 8 Claims



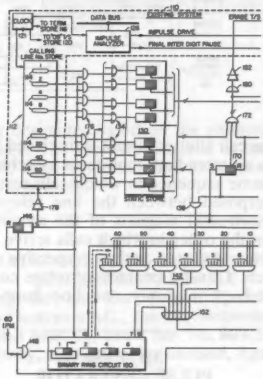
A position detector detects the presence of a travelling foreground subject and then enables a light projector, such as a Strobo tube, to provide short duration flashes when the foreground subject is at an optimum predetermined position relative to the position of the light projector. A photoelectric conversion device is provided to pick up an image of the illuminated foreground subject, signals corresponding to the picked up image being processed and, if desired, stored to provide a permanent record.

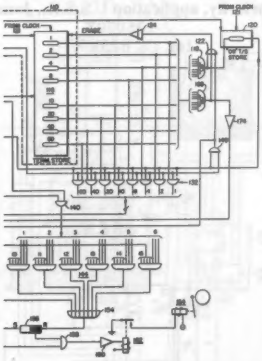
3,577,154

CODE CALL FACILITY FOR ELECTRONIC TELEPHONE EXCHANGE

William F. Bartlett, Irondequoit, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,757
Division of Ser. No. 557,042, June 13, 1966, Pat. No. 3,459,896.
Int. Cl. H04m *11/02*
U.S. Cl. 179—18 3 Claims



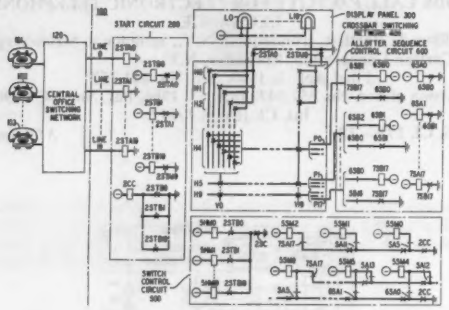


A telephone exchange code call circuit wherein a static store applies gating signals to a selected gate in each of two sets of gates, the first set designating a tens digit and the second set designating a units digit. The gates in the first and second set receive time spaced signals in a predetermined sequence so that the selected gate in the first set is first enabled and the selected gate in the second set is subsequently enabled, by the simultaneous presence of the gating and timed spaced signals. An output circuit, responsive to the enabled gates in the first and second set produce a code call signal corresponding to that in the static store.

3,577,155
ALLOTTER CIRCUIT FOR SEQUENTIAL INDICATION OF INCOMING TELEPHONE CALLS

Witold E. Swierczewski, Daly City, Calif., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,395
Int. Cl. H04m 5/04
U.S. Cl. 179—27 7 Claims

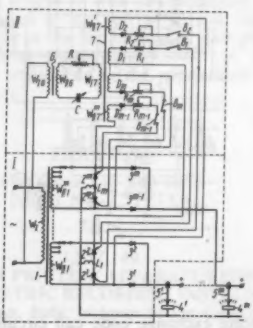


A telephone call allotter circuit is disclosed for lighting the line lamps on an attendant console or switchboard, one at a time, in the same sequence in which calls arrive. A crossbar switch is interposed between the line relays and the line lamps. The horizontal magnets of the switch are operated sequentially in the order in which calls arrive. The line lamp of each line is associated with a respective vertical of the crossbar switch. Transfer contacts of relays controlled by the crossbar switch permit only one line lamp at a time to operate.

3,577,156
PULSE GENERATOR

Boris Evgenievich Paton, Ulitsa Kotsjubinskogs, 9, Kv. 21; Vladimir Konstantinovich Lebedev, Ulitsa Engelsa, 25, Kv. 12; Petrovich Pavel Sheiko, Ulitsa Tatarskaya 2-b Kv. 12, and Mikhail Petrovich Pashulya, Ulitsa Konstantinovskaya-61, Kv. 11, Kiev, U.S.S.R.

Filed Mar. 10, 1969, Ser. No. 805,656
Claims priority, application U.S.S.R., June 14, 1968, 1250703
Int. Cl. B23k 9/10
U.S. Cl. 219—131 2 Claims

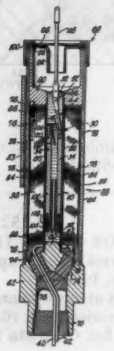


A novel pulse generator for pulse arc welding and building up of parts by one or several arcs is disclosed, the novel generator comprising a pulse unit and a control unit. The pulse unit comprises a transformer, the number of secondary windings of which corresponds to the number of welding arcs, or the number of secondary windings is half the number of welding arcs, so as to ensure simultaneous operation of the required number of welding arcs.

3,577,157
INTEGRATING DEVICE FOR USE IN INDUSTRIAL PROCESS CONTROL APPARATUS

Robert J. Robinson, Lexington, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Division of Ser. No. 500,612, Oct. 22, 1965, Pat. No. 3,441,053.
Filed May 16, 1968, Ser. No. 749,230
Int. Cl. G06g 7/18; F16k 31/143
U.S. Cl. 235—183 13 Claims

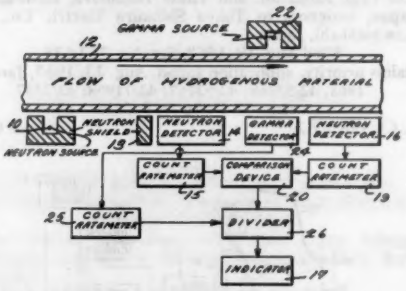


An industrial process control system wherein a digital data processor controls process conditions in a time shared manner by periodically sampling the conditions and then communicating in sequential order with the process regulating means by use of a series of constant amplitude command signals whose time duration is proportional to the change to be made in the process regulating means and a device for translating a command signal of this type to a suitable control signal for changing the setting of the process regulating means.

3,577,158
MASS FLOW RATE MEASURING UTILIZING THE SCATTERING CROSS SECTION OF A MATERIAL FOR FAST NEUTRONS

Linus K Hahn, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

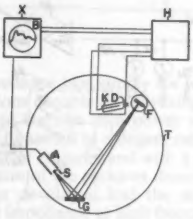
Continuation of application Ser. No. 522,778, Jan. 24, 1966, now abandoned. This application Jan. 7, 1969, Ser. No. 792,201
Int. Cl. G01n 23/12
U.S. Cl. 250—43.5 17 Claims



Measuring mass flow rate of a fluid material having a high scattering cross section for fast high energy neutrons by radiating the material with such neutrons which are slowed to lower energy thermal neutrons and detecting the thermal neutrons downstream to effect a determination therefrom of the mass flow rate. For a more accurate determination of the mass flow rate, a second thermal neutron detector

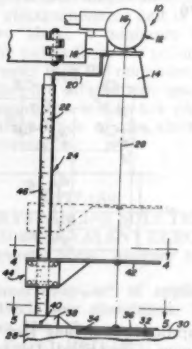
downstream has its output compared to the first detector output. Further, a gamma source and detector is employed to derive the density of the material and to obtain the velocity thereof by division of the mass flow by the density.

3,577,159
DIFFRACTION GRATING X-RAY SPECTROMETER WHEREIN AN ELECTRON BEAM IS SCANNED ACROSS A FIXED X-RAY EMITTING ELEMENT
Masao Sawada, 525 Ikejiri, Sayama-cho Minami Kawachigun, Osaka-Fu, Japan
Filed Jan. 2, 1968, Ser. No. 694,933
Int. Cl. G01n *23/22*
U.S. Cl. 250—51.5 **6 Claims**



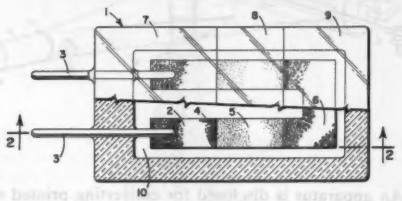
A diffraction grating spectrometer having an X-ray tube in a fixed position, the ray-source of which is rapidly moved back and forth on a definite curve. Diffracted beams from the grating surface are focused on a slit of a fixed electronic counter and the intensities of the spectral distribution are observed or measured by a suitable means. The positions of the ray-source and the counter are the reverse of those in the previously known spectrometers.

3,577,160
X-RAY GAUGING APPARATUS WITH X-RAY OPAQUE MARKERS IN THE X-RAY PATH TO INDICATE ALIGNMENT OF X-RAY TUBE, SUBJECT AND FILM
James E. White, 7342 E. Thomas, Scottsdale, Ariz. 85257
Filed Jan. 10, 1968, Ser. No. 696,730
Int. Cl. G03b *41/16*
U.S. Cl. 250—59 **13 Claims**



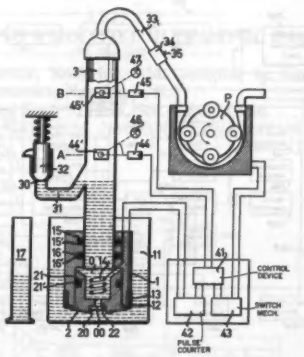
X-ray photographic apparatus through which reference data is photographically recorded on the film exposed to the X-rays together with the image of a subject being diagnosed. A locator for producing landmark images is also mounted on the subject, so that photographic records of the subject may be evaluated in light of both image distortion due to geometric misalignment and variation in the anatomy of the subject.

3,577,161
RADIATION DOSIMETER HAVING SENSITIVE MATERIAL CONTAINING LITHIUM HYDRIDE
Martin Oberhofer, Taino, and Jurgen Jaspert, Cittiglio, Italy, assignors to European Atomic Energy Community (Euratom), Brussels, Belgium
Filed Dec. 8, 1967, Ser. No. 689,098
Claims priority, application Netherlands, Dec. 21, 1966, 66/17951
Int. Cl. G01t *1/11, 3/00*
U.S. Cl. 250—71 **10 Claims**



A radiation dosimeter based on the phenomenon of thermoluminescence. The sensitive material in the dosimeter is, at least in part, lithium fluoride, and to the sensitive material is added lithium hydride.

3,577,162
AUTOMATIC COUNTING SYSTEM FOR FLUID SUSPENDED PARTICLE
Hermann Gaehwiler, and Kurt Schoen, Zurich, Switzerland, assignors to Contraves AG., Zurich, Switzerland
Filed Mar. 21, 1969, Ser. No. 809,332
Claims priority, application Switzerland, Apr. 19, 1968, 5869/68
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **4 Claims**

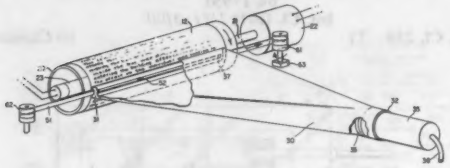


A novel counting system for counting particles suspended in a fluid medium is disclosed. The counting system comprises electrode means for sensing the presence of particles in a fluid means and producing a signal representative thereof; conveying means for conveying the fluid medium through said electrode means into a measuring tube; an upper and a lower spaced apart fluid level sensing means disposed at the measuring tube; and counter means coupled with said sensing means and said electrode means for counting said signals, said counter means being turned on by said lower sensing means when the fluid reaches the lower level in the measuring tube, and being turned off by said upper sensing means when the fluid reaches the upper level in the measuring tube.

3,577,163
PRINT READER COMPRISING TWO MUTUALLY ORTHOGONAL SCANNING SLITS AND A DRUM HAVING A LIGHT TRANSMISSIVE SURFACE

William J. Riffe, R.R. #2, Short Line Pike, Berea, Ky.

Filed May 6, 1969, Ser. No. 822,155
Int. Cl. G01n *21/30*; H01j *3/14, 5/02*
U.S. Cl. 250—219 3 Claims

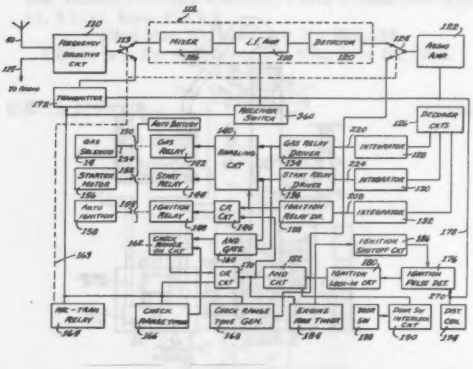


An apparatus is disclosed for converting printed material of any typefont into electrical signals suitable for conversion and use with a digital computer. Light transparent paper, with light impervious printed matter thereon, is placed on a roll and illuminated uniformly from within such roll. The page is scanned on a line to line basis by rotating the roll intermittently, and on a character by character basis by a motor driven tape carrying a light slit. The resulting light signal is converted into an analog electric signal representative of the scanned print, which can be converted to digital form for use in electronic data processing equipment.

3,577,164
REMOTE CONTROL STARTING SYSTEM

Giuseppe Re Baratelli, Glenview, and Theodore J. Galvani, Deerfield, Ill., assignors to Ramostar Corporation, Deerfield, Ill.

Filed June 5, 1968, Ser. No. 734,744
Int. Cl. F02n *11/08*
U.S. Cl. 290—38 13 Claims

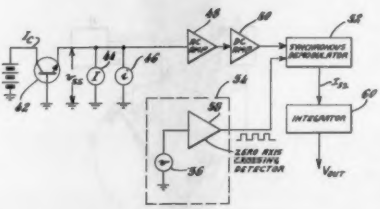


A system for remotely controlling electrical devices as in the starting of automobiles and the like employing a transceiver, a receiver-transmitter and an actuating solenoid. The transceiver includes circuitry adapted to transmit selected radio frequency signals for performing selected functions during starting of the automobile. The receiver-transmitter includes circuitry adapted to transmit a signal to the transceiver upon receipt of a first check range signal from the transceiver, energize the auto ignition circuit and energize the auto starter upon receipt of a second signal from the transceiver, and energize the actuating solenoid upon receipt of a third signal. The solenoid is adapted to actuate the fuel linkage upon being energized. The receiver-transmitter circuit is further adapted to limit the running time of the engine upon starting, transmit an intermittent signal to the transceiver during initial engine running, and stop the engine upon opening a door of the auto during the initial engine running period.

3,577,165
LINEAR SCANNING ARRANGEMENT FOR A CYCLOIDAL MASS SPECTROMETER

Bradley A. Helliwell, Mountain View, and Donald D. Briglia, Palo Alto, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 31, 1968, Ser. No. 733,564
Int. Cl. H03k *5/00, 7/00, 9/00*
U.S. Cl. 307—228 9 Claims

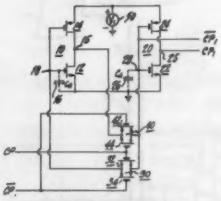


A partial pressure gauge scanning circuit arrangement for generating an electrostatic ion beam deflection voltage having a deflection waveform segment defined by the function $V=f(1/t)$, where V=deflection voltage and t=time, includes a circuit means having a nonlinear transfer characteristic, the derivative of which is proportional to the function $f(1/t)$. Circuit means apply an alternating signal of frequency f_1 and a signal of relatively lower frequency f_2 to the nonlinear circuit means in a manner for providing an amplitude modulated output signal of frequency f_1. The output signal exhibits a modulation envelope defined by the differential of the logarithmic characteristic. Circuit means are provided for demodulating and integrating the amplitude modulated signal to provide a scanning output signal having a waveform defined as an inverse function of time.

3,577,166
C-MOS DYNAMIC BINARY COUNTER

Abraham K. Yung, East Brunswick, N.J., assignor to RCA Corporation

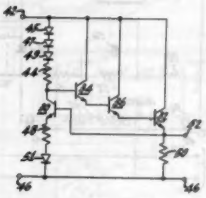
Filed Sept. 17, 1968, Ser. No. 760,218
Int. Cl. H03k *3/26*
U.S. Cl. 307—279 14 Claims



A dynamic flip-flop comprising two inverter means and two switching means is described. The switching means couple, by different conduction paths, the input node of one inverter means to the input node and to the output means of the other inverter. The switching means are alternately enabled by a clocking signal varying at a first rate causing the signals at the inputs and outputs of both inverter means to vary at one half said first rate.

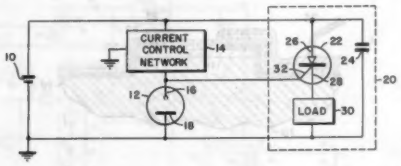
The temporary or momentary storage provided by the capacitance at the input node of an inverter stage, coupled with the single pole, double throw action of the switching means, enables the design of a dynamic binary counter using a minimum number of components.

3,577,167
INTEGRATED CIRCUIT BIASING ARRANGEMENTS
Jack Avins, Princeton, N.J., assignor to RCA Corporation
Filed Feb. 29, 1968, Ser. No. 709,274
Int. Cl. H02m *3/14*
U.S. Cl. 307—296 10 Claims



A low output impedance bias supply for integrated circuit amplifier configurations capable of delivering an output voltage that is a constant fraction of a power supply potential. Two transistors are connected in a degenerative feedback arrangement with a pair of resistors and with a pair of semiconductor diodes, the ratio of the resistors determining the fractional output voltage developed and the diodes serving to provide a low output impedance at high frequencies.

3,577,168
LONG DELAY TIMING SYSTEM
William J. Tuten, and Godfrey R. Gauld, Richmond, Ind., assignors to Avco Corporation, Richmond, Va.
Filed June 21, 1968, Ser. No. 739,011
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 7 Claims

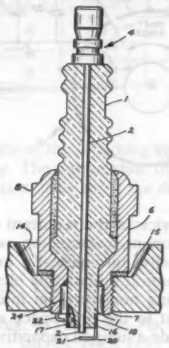


The disclosure illustrates a longterm timing system comprising a battery coupled to an electrochemical cell through a pulsing circuit. The electrochemical cell is of the type that requires current flow above a minimum value to enable proper operation. The pulses from the pulsing circuit have a peak substantially greater than the minimum permissible current level but the pulses are substantially spaced in time. The resultant average current flow is then low enough so that the time at which the impedance of the electrochemical cell changes is greatly increased.

3,577,169
COEXISTING CRYSTALLINE SOLUTION PHASES ACTIVATED BY DIVALENT EUROPIUM
Thomas L. Barry, Beverly, Mass., assignor to Sylvania Electric Products, Inc.
No. drawing. Continuation-in-part of application Ser. No. 506,868, Nov. 8, 1965, now abandoned. This application Aug. 5, 1968, Ser. No. 750,122
Int. Cl. H01j *1/63*
U.S. Cl. 313—109 3 Claims

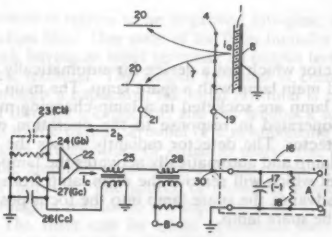
A blue-emitting Eu^{2+} activated, fluorescent phosphor of coexisting crystalline phases of the spinel structure of $MgAl_2O_4$ and the corundum structure of α Al_2O_3 is useful in fluorescent and mercury vapor lamps. The essential cations of each structure are Al, Mg and Si. In the corundum phase, the Si^{4+} and Mg^{2+} ions displace Al^{3+} ions, are disposed in the corundum lattice of Al_2O_3 and are present in significant quantities, but less than the limit of mutual solubility of the Si^{4+} and Mg^{2+} ions in the corundum lattice. In the spinel phase, Si atoms and site vacancies displace Mg atoms in the spinel lattice and are present in significant quantities, but less than the limit of solubility of Si atoms and vacancies in the spinel lattice.

3,577,170
DOUBLE-GAP SPARK PLUG
Gustav P. Nylen, 5868 Picker St., Arlington, Calif.
Filed Jan. 15, 1969, Ser. No. 791,446
Int. Cl. H01t *13/46, 13/22*
U.S. Cl. 313—123 2 Claims



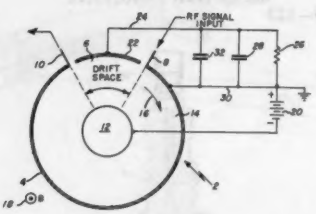
A spark plug having two spark gaps connected in series, the first gap being formed between the main, positive electrode extending lengthwise through the plug and a first electrode finger attached to a conductor sleeve embracing the lower end of the porcelain insulating stem of the plug. The second spark gap is defined between the conductor sleeve and a second electrode finger attached to the conductive base portion of the plug which is secured in threaded engagement with an engine block.

3,577,171
SYSTEM USING A MODIFIED ULTRASONIC IMAGING TUBE
William R. Turner, Rockville, Md., assignor to Vitro Corporation of America, New York, N.Y.
Filed Sept. 3, 1968, Ser. No. 756,866
Int. Cl. G01n *9/24, 29/00;* H01j *29/41, 31/48*
U.S. Cl. 315—9 2 Claims



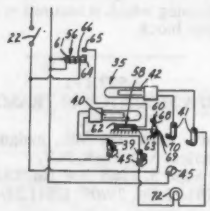
An improved ultrasonic to visual signal conversion system utilizing a cathode ray tube, said tube having a piezoelectric face plate or conversion plate, a controlling screen adjacent thereto and a collector electrode back of the screen for receiving current generated by the conversion plate. The collector current is utilized to control a video tube synchronized with the first tube, and is shunted in feedback fashion to the screen to control terminal admittance thereof and thereby increase the signal to noise ratio of the system as well as to raise the effective signal level.

3,577,172
SELF-QUENCHING ELECTRODE FOR CROSSED FIELD TRAVELING WAVE DEVICES
Edward C. Dench, Annisquam, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Nov. 28, 1969, Ser. No. 880,580
Int. Cl. H01j 25/34
U.S. Cl. 315—39.3 11 Claims



A crossed field device of the reentrant electron beam and nonreentrant nonresonant transmission network type having means for substantially automatically quenching electron-traveling wave interaction initiated by electromagnetic energy signal pulses during nonoperation intervals. Such means are disposed adjacent to the drift space area of the interaction region and include a lumped capacitive-resistive network coupled to electrode means to rapidly terminate electron emission.

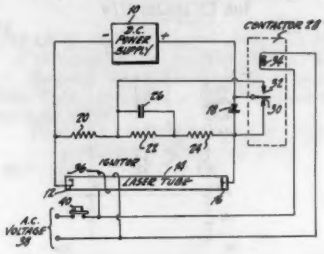
3,577,173
LAMP FAILURE DETECTION AND CHANGE DEVICE
Jack P. Blomgren, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 10, 1969, Ser. No. 790,415
Int. Cl. F21v 19/04; H05h 37/04
U.S. Cl. 315—88 5 Claims



A projector which has a device for automatically replacing an expired main lamp with a spare lamp. The main lamp and the spare lamp are socketed in a lamp-changing mechanism which is operated in response to the operation of a lamp failure detector. The detector radiantly senses the failure of the main lamp and automatically activates the lamp-changing mechanism which will remove the main lamp from the focus position, advance the spare lamp into the focus position, and energize the spare lamp.

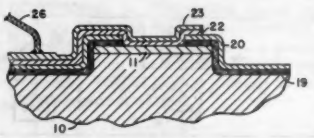
3,577,174
CIRCUIT FOR STARTING AND MAINTAINING A DISCHARGE THROUGH A GAS DISCHARGE TUBE
Richard W. Longsderff, Lancaster, Pa., assignor to RCA Corporation
Filed Sept. 20, 1968, Ser. No. 761,083
Int. Cl. H05b 37/00
U.S. Cl. 315—170 9 Claims

A capacitance, which is charged by the output of a DC power supply, is placed in series aiding relationship with the output of the DC power supply during the start period of a gas discharge tube, i.e., until ignition is achieved and the capacitance discharges through the tube. This permits the required "fill in" or "boost" voltage to be obtained during



starting without drawing excessive peak currents from the power supply when ignition is started.

3,577,175
INDIUM ANTIMONIDE INFRARED DETECTOR CONTACT
Norman I. Gri, Cincinnati, and Eugene T. Yon, Cleveland, Ohio, assignors to Avco Corporation, Cincinnati, Ohio
Division of Ser. No. 723,994, Apr. 25, 1968, Pat. No. 3,483,096.
Filed July 3, 1969, Ser. No. 860,448
Int. Cl. H01l 15/06
U.S. Cl. 317—237 2 Claims

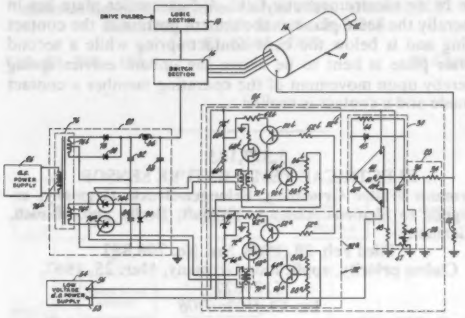


The invention here disclosed is an indium antimonide infrared detector having a novel contact region. The detector comprises a substrate, constituted of an N-material with a P-region fused thereon. An anodized surface oxide film is superimposed over the diffused P-region and over the adjacent surface of the substrate. A silicon oxide layer is disposed over most of the anodized surface oxide film but exposes a portion of the P-region which portion comprises superimposed layers of chromium and gold which form the contact region, said layers masking the contact area and rendering it insensitive to infrared radiation and simultaneously providing a pad to which an electrical connection may conveniently be made.

3,577,176
CONSTANT CURRENT STEP MOTOR SYSTEM
Marvin L. Kreithen, Feasterville, and John J. Lawler, Newportville, Pa., assignors to Compudyne Corporation, Hatboro, Pa.
Filed Apr. 26, 1968, Ser. No. 724,556
Int. Cl. H02p 7/06
U.S. Cl. 318—432 7 Claims

In a control circuit for a step motor, current through the motor windings is sensed by voltage drop across a series resistor. This voltage is used to control a feedback circuit which regulates the power supply in such a way that the output torque of the step motor remains constant. Preferably the potential across the series resistor is compared with a voltage reference. Any error signal generated as a result of a difference is used to generate pulses at a frequency proportional to the error voltage derived from the sensing resistor. These

pulses are synchronized with a rectified alternating current input and are used to determine and select whatever part of

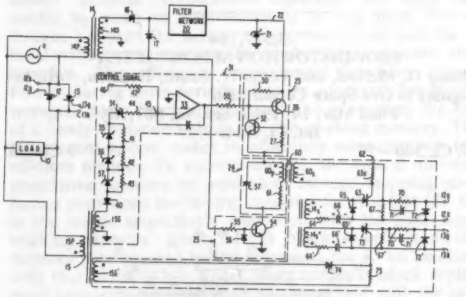


that input, if any, will be used to supplement available current to maintain constant the torque of the step motor.

3,577,177
ZERO-CROSSING SILICON CONTROLLED RECTIFIER CONTROL SYSTEM

Clarence Wilson Hewlett, Jr., Hampton, N.H., assignor to General Electric Company

Filed June 26, 1969, Ser. No. 836,816
Int. Cl. G05f *1/44*
U.S. Cl. 323—18 **12 Claims**



A zero-crossing silicon controlled rectifier control system for single-phase, full-wave and three-phase operation. An error signal representing the difference between desired and actual load values in integrated to control a first switch constituted by complementary transistors. A second switch, in series with a pulse generator and the first switch, is conductive during portions of alternate half cycles. Concurrent conduction by both switches energizes the pulse generator which causes a pulse to be generated on the energization. This turns on a first silicon controlled rectifier at the beginning with the positive-going zero crossing. A second silicon controlled rectifier controlled by a trigger circuit conducts during the next half cycle in response to load energization.

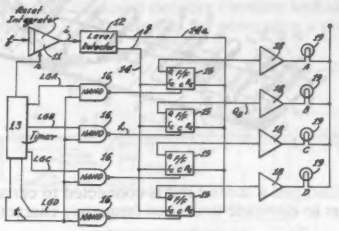
3,577,178
PHASE LOCK INDICATOR FOR PLURAL PHASE LOCK LOOPS

Opie D. Hawley, San Pedro, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Apr. 15, 1969, Ser. No. 816,225
Int. Cl. G01r *25/00*
U.S. Cl. 324—83D **6 Claims**

An indicator or monitor is disclosed which shows whether each of a plurality of phase lock loops are locked onto their respective incoming signals or not. The output of a single in-

phase detector which is time-shared by the several loops is fed to a reset integrator, then a level detector, and to the set-reset terminals of a plurality of flip-flops. The flip-flops are sequentially clocked by respective timing signals correspond-

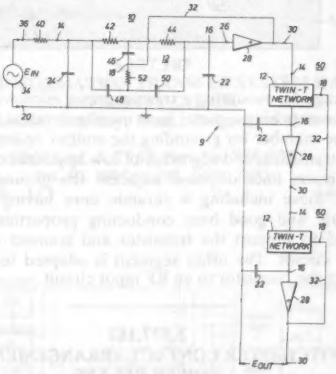


ing to the occurrence of the incoming signals associated with their particular loop. The output state of each flip-flop drives an indicator lamp circuit to show the desired locked or not locked condition.

3,577,179
ACTIVE FILTER

Duval West, Houston, Tex., assignor to Geo Space Corporation

Filed Aug. 6, 1969, Ser. No. 847,860
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 **12 Claims**



This invention relates to an improved low-pass, active, elliptic-function filter. One state of the filter includes a twin-T, RC network having an input terminal, an output terminal and a feedback terminal. The output terminal is connected to ground through a capacitor; the input terminal is connected to ground through a capacitor; and the feedback terminal is connected to the output terminal of a noninverting amplifier having a gain greater than or equal to unity. The input terminal of the amplifier is connected to the output terminal of the twin-T network. The source of incoming signals is connected through a resistor to the input terminal of the twin-T network. The filter can be made to include two or more stages connected in tandem combination.

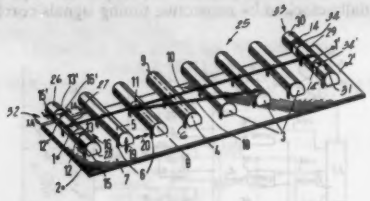
3,577,180
ELECTROMECHANICAL FILTER

Hans Albsmeier, and Karl Traub, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed May 1, 1968, Ser. No. 725,790
Claims priority, application Germany, May 12, 1967, S109,856
Int. Cl. H03h *9/26*
U.S. Cl. 333—72 **12 Claims**

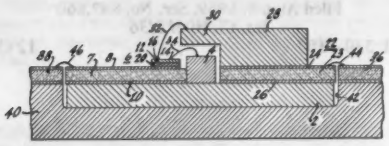
An electromechanical filter utilizing a plurality of rods mounted on a base plate parallel to each other and having

one side of each resonator flattened or coupled together by a driving rod. Input and output electromechanical transducers



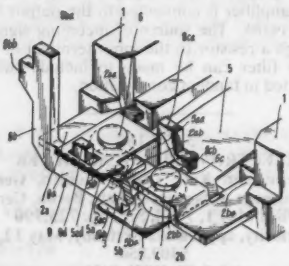
are provided and a second rod is connected to certain of said resonators to eliminate undesired frequency characteristics.

3,577,181
TRANSISTOR PACKAGE FOR MICROWAVE STRIPLINE CIRCUITS
Erwin F. Belohoubek, Kendall Park, N.J., assignor to RCA Corporation
Filed Feb. 13, 1969, Ser. No. 799,019
Int. Cl. H01p *3/08*
U.S. Cl. 333—84 **3 Claims**



Package for mounting a transistor in a microwave stripline circuit comprising a metal base member, means disposed on the base member for grounding the emitter or base electrode of the transistor, and segments of low impedance microwave transmission lines disposed adjacent the grounding means, one of these including a ceramic core having both good dielectric and good heat conducting properties and being adapted to support the transistor and connect it to an RF output circuit. The other segment is adapted to electrically connect the transistor to an RF input circuit.

3,577,182
SWITCH-OVER CONTACT ARRANGEMENT FOR POWER RELAYS
Herbert Krautwald; Helmut Moller, and Richard Siepmann, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Feb. 17, 1969, Ser. No. 799,785
Claims priority, application Switzerland, Feb. 19, 1968, 2470/68
Int. Cl. H01h *1/12*
U.S. Cl. 335—185 **10 Claims**

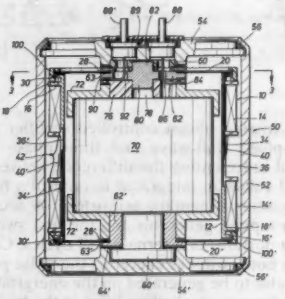


A low profile power relay contact is made possible by an assembly comprising a bifurcated contact spring having one shank bent above a level of the spring and overlapping an unbent shank whereby the bifurcated portions securely grip but do not impart rotative forces to an operating member which is moved up and down in response to movement of an armature by an electromagnetic field. A first carrier plate lies in generally the same plane as the unbent portion of the contact spring and is below the bent contact spring while a second carrier plate is bent to lie above the unbent carrier spring whereby upon movement of the operating member a contact is made and a contact is broken.

3,577,183
ELECTRICAL TEMPERATURE SENSOR
Hermann Walter Gruenling, Erlangen-Bruck, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Feb. 28, 1968, Ser. No. 708,882
Claims priority, application Germany, Mar. 25, 1967, S109022
Int. Cl. H01c *7/08*
U.S. Cl. 338—26 **4 Claims**

Wire of a material having electrical resistance which varies in magnitude in accordance with temperature variations is covered with glass insulation and is directly mounted on a body whose temperature is to be sensed.

3,577,184
LOW-DISTORTION SEISMOMETER
William O. McNeel, and Louis W. Erath, Houston, Tex., assignors to Geo Space Corporation
Filed Mar. 14, 1969, Ser. No. 807,186
Int. Cl. H04r *9/04*
U.S. Cl. 340—17 **9 Claims**

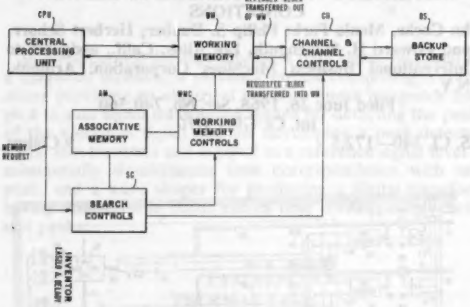


A compact, high-sensitivity, low-distortion, electromagnetic-type seismometer having a pair of coils forming part of a mass-coil assembly concentrically suspended in an annular airgap established by a permanent magnet. The suspension system includes a pair of spring spiders which are clampingly secured to the mass-coil assembly by a pair of insulating retainer rings to allow the springs and the mass-coil assembly freedom of relative motion when the mass-coil assembly becomes subjected to unbalanced rotational moments. The symmetry of construction assures a compact, rugged seismometer of very low distortion. Advantage is taken of the preformed stresses in the springs to assure continuous, wiping, low-resistance contacts between the current-carrying springs and the coil terminals.

3,577,185
ON-LINE SYSTEM FOR MEASURING THE EFFICIENCY OF REPLACEMENT ALGORITHMS

Laszlo A. Belady, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,265
Int. Cl. G06f *15/00*
U.S. Cl. 340—172.5 **10 Claims**



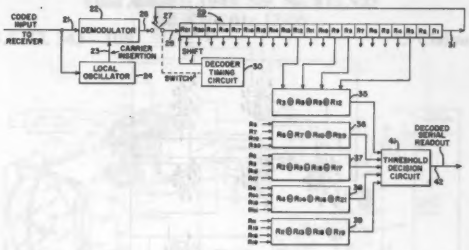
Technique for dynamically measuring the efficiency of a replacement algorithm in a virtual-memory data processing system. Each time the actual replacement algorithm effects the replacement of a "block" or "page" stored in the working memory, the measurement system automatically compares the number of such replacement that have been made with the number that would have been required by an assumed "optimal" replacement algorithm, the latter being unable to make its determinations in real time. The difference between the actual replacement count and the optimal replacement count is the number of unnecessary block transfers. The efficiency measurement functions are performed during those periods when the processor has been interrupted for a block replacement and is awaiting the entry of a newly demanded block into the working memory. Thus, the present system makes its efficiency measurements in an efficient manner. To accomplish this, the system utilizes an associative memory or equivalent storage mapping means having provisions for storing special reference bits (R′ bits) in the words respectively associated with the addresses in working memory. Each time a block stored in working memory is referenced by the processor, the R′ bit associated with that block is set. Then, when the next block replacement occurs, the measurement system is able, with the aid of these R′ bits, to update the optimal replacement pattern, or more specifically, to determine what blocks currently would have been present in the working memory if the optimal replacement algorithm had been followed and, therefore, whether the currently demanded replacement operation would have been necessary if said algorithm had been followed. The measurement system also is able to detect the occasional instances, if any, in which the actual replacement algorithm is able to avoid making a block replacement that the optimal algorithm would have found necessary. The system is further able to detect when, due to incomplete knowledge of the order of referencing, it is uncertain whether the optimal algorithm could have avoided making the currently demanded block replacement, and in such a case the system specifies a possible range of values for the replacement efficiency.

3,577,186
INVERSION-TOLERANT RANDOM ERROR CORRECTING DIGITAL DATA TRANSMISSION SYSTEM

Michael E. Mitchell, Syracuse, N.Y., assignor to General Electric Company

Filed May 28, 1969, Ser. No. 828,485
Int. Cl. G08c *25/00;* **H04l** *7/00*
U.S. Cl. 340—146.1 **4 Claims**

A digital data transmission system is disclosed which decodes received error correction coded digital signals properly, irrespective of whether or not the polarities of these signals have become inverted during transmission or reception. The system thus permits a 180° phase ambiguity in the reinsertion of a regenerated suppressed carrier or subcarrier signal in the receiver, thereby simplifying the receiver in addition to correcting errors to improve the reliability of data transmission. The disclosed decoder circuitry includes a plurality of modulo 2 adder circuits for generating a plurality of

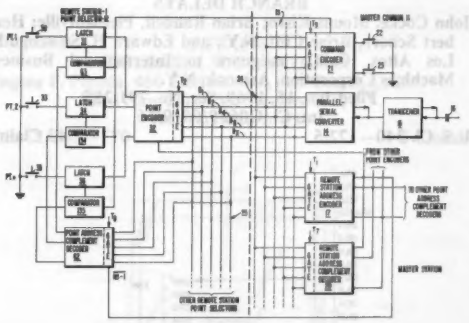


estimators each of which is the mod 2 sum of an even number of the received digits. These estimators are fed to a threshold decision circuit which provides a serial readout of the decoded digits. The threshold decision circuit may consist of a simple majority decision circuit or a multiple input threshold circuit with either equal or unequal weighting factors on its input estimators.

3,577,187
DIGITAL INFORMATION TRANSFER SYSTEM HAVING INTEGRITY CHECK

Ralph A. Benson, Peabody, Mass., assignor to General Electric Company

Filed Sept. 3, 1968, Ser. No. 756,995
Int. Cl. H04g *1/00, 3/00, 5/00*
U.S. Cl. 340—163 **14 Claims**

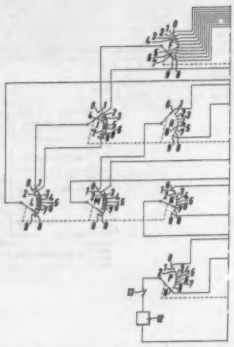


A digital information transfer system for selecting and then enabling a remote utilization device by a digital address including means for assuring system integrity. A selector is actuated to energize one comparator input and generate a unique digital address to enable one utilization device. The digital complement of the enabled utilization device address is generated and transmitted to a decoder at the selector. If the correct utilization device is enabled, the digital complement is decoded to energize the second comparator input. Simultaneous energization of two comparator inputs enables means for operating the utilization device. If a system malfunction occurs, inputs to two different comparators are energized, thereby blocking further operation.

3,577,188
COUNTER-OPERATED CONTROL SYSTEMS

John A. Thomson, and Brian R. Evill, Surrey, England, assignors to Avery-Hardoll Limited, Chessington, Surrey County, England

Filed Apr. 30, 1968, Ser. No. 725,303
Int. Cl. H04q 1/20
U.S. Cl. 340—164 4 Claims

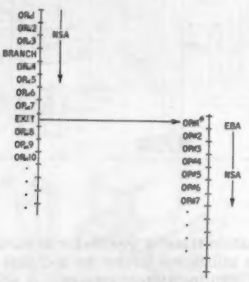


A counter-operated control system which can be set to initiate at least two control operations, one at a count which is less by a predetermined number than a selected maximum count, the other comprises a series of counters counting, for example, units, tens, hundreds etc., a separate settable unit associated with each counter and means responsive to the arrival of the counters at at least two numbers bearing different relations to the settings of the associated settable units to provide successive operation initiating signals to initiate the two control operations.

3,577,189
APPARATUS AND METHOD IN A DIGITAL COMPUTER FOR ALLOWING IMPROVED PROGRAM BRANCHING WITH BRANCH ANTICIPATION REDUCTION OF THE NUMBER OF BRANCHES, AND REDUCTION OF BRANCH DELAYS

John Cocke, Mount Kisco; Brian Randell, Pleasantville; Herbert Schorr, Briar Cliff, N.Y., and Edward H. Sussenguth, Los Altos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,255
Int. Cl. G06f 9/00, 9/16
U.S. Cl. 340—172.5 13 Claims

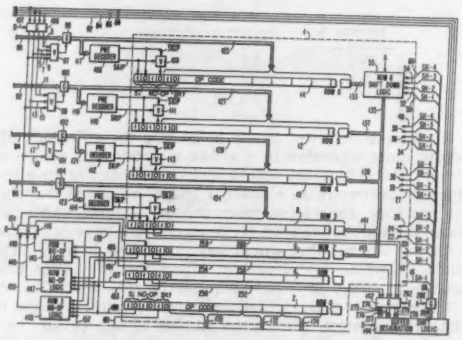


Apparatus and a method in a digital computer is disclosed for allowing improved program branching from a first instruction sequence to a second instruction sequence. Said apparatus includes means for decoding a branch instruction in said first sequence; means for determining parameters which are to enter into a condition determination, the resolution of which defines whether or not the branch is to be made, means for detecting a specific type instruction in said first sequence subsequent to said branch instruction, said specific type instruction indicative of the point in the first instruction sequence at which the branch is to be made; and means responsive to said detection for ordering instructions from said second instruction sequence to be processed subsequent to the processing of said specific type instruction.

3,577,190
APPARATUS IN A DIGITAL COMPUTER FOR ALLOWING THE SKIPPING OF PREDETERMINED INSTRUCTIONS IN A SEQUENCE OF INSTRUCTIONS, IN RESPONSE TO THE OCCURRENCE OF CERTAIN CONDITIONS

John Cocke, Menlo Park; Philip S. Dauber; Herbert Schorr, and Edward H. Sussenguth, Los Altos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1968, Ser. No. 740,360
Int. Cl. G06f 9/10
U.S. Cl. 340—172.5 9 Claims

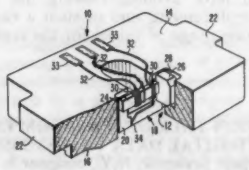


Apparatus in a digital computer for allowing the skipping of predetermined instructions in a sequence of instructions is disclosed. Means are provided for detecting a specific type of instruction in a sequence of instructions. This specific type of instruction is referred to as a skip instruction and indicates that upon the occurrence of a specified machine condition, predetermined subsequent instructions in said sequence are to be skipped. Further means are provided to determine the occurrence of the specified machine condition, and to emit an output signal indicative of the occurrence. Means responsive to the output signal effect the skipping of the predetermined instructions.

3,577,191
MAGNETIC HEAD ASSEMBLY WITH SIDEBAR

Eduard E. Haertlein, Fremont, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1968, Ser. No. 750,227
Int. Cl. G11b 5/10, 5/42
U.S. Cl. 340—174.1F 8 Claims

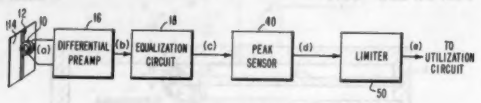


A magnetic head assembly, useful for noncontact magnetic recording, is formed to provide an inner cavity, wherein a thin magnetic core is fixed against a cavity wall. A magnetic sidebar, to which electrical coils are mounted, is secured adjacent to the core to complete the magnetic circuit.

3,577,192
REPRODUCE HEAD WITH PEAK SENSING CIRCUIT

Carl E. Schlaepfer, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1968, Ser. No. 702,265
Int. Cl. G11b 5/02
U.S. Cl. 340—174.1H 2 Claims

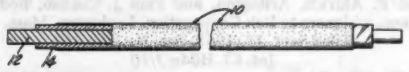


In an apparatus for reproducing a data signal recorded on a magnetic medium, a playback circuit comprising a transducer providing an electrical signal, a linear integrator coupled to said signal transducing means for detecting the peaks of the electrical signal and for developing a peak-detected signal that traverses and is equal to a reference signal level in substantially simultaneous time correspondence with said peak; and a wave shaper for producing a digital waveform having transitions in simultaneous time correspondence with said peaks.

3,577,193
THERMAL CELL

Irving J. Hutkin, San Diego, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Division of Ser. No. 475,022, July 26, 1965, Pat. No. 3,416,971.
Filed Mar. 22, 1968, Ser. No. 737,266
Int. Cl. G08b 17/06; H01c 7/00; H01v 1/14
U.S. Cl. 340—228 2 Claims

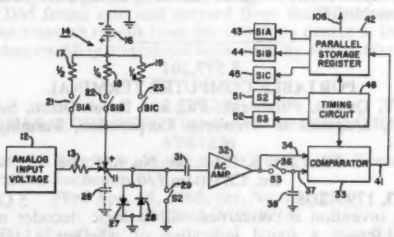


An improved device in the form of a web for detecting fires and other high temperature conditions comprises a conductive ring with a number of filamentary thermal cells mounted thereon, each cell including a core comprising stainless steel with a glass coating of specific composition disposed on the core and ionically conductive at a certain temperature. A sheath of metal, such as silver, dissimilar to the core metal is disposed on the glass coating. A lattice form of a spaced plurality of intersection cells connected at opposite ends to the ring and interwoven with one another at the intersections is provided.

3,577,194
ANALOG TO DIGITAL CONVERSION CIRCUIT

Donald L. Beall, Syracuse, N.Y., assignor to General Electric Company

Filed Jan. 3, 1969, Ser. No. 788,867
Int. Cl. H03k 13/02
U.S. Cl. 340—347AD 4 Claims

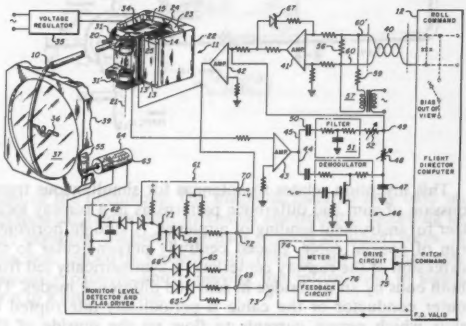


An analog-to-digital conversion circuit is disclosed, which converts a varying analog signal to the nearest available digital value by the successive approximation technique. The circuit includes a summing mode for the analog and various digital voltages, followed by a chopper switch, AC amplifier, sample-and-hold circuit, voltage comparator, and digital approximation control circuits. The advantageous results are high speed, excellent resolution and accuracy, and low drift characteristics.

3,577,195
SERVOED METER APPARATUS

Charles E. Clift, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed Apr. 14, 1969, Ser. No. 815,933
Int. Cl. G01r 17/06
U.S. Cl. 343—108 13 Claims

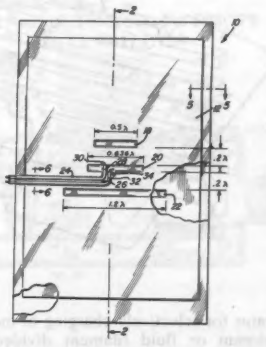


Apparatus for positioning an indicator in accordance with a control signal including a D'Arsonval-type meter movement having an auxiliary AC excitation winding on the field magnet thereby providing both a unidirectional and an alternating flux field for the meter movement magnetic circuit. The meter armature has two windings, one being excited by a control signal and reacting with the unidirectional field to displace the armature and the other operating to sense both the displacement of the armature and the rate of change of said displacement by reacting respectively with the alternating and unidirectional fields. When included in a closed-loop servosystem the meter movement operates as both a servodrive and an angular motion transducer providing displacement and rate feedback terms.

3,577,196
ROLLABLE SLOT ANTENNA

Eugene F. Pereda, 460 Electric Ave., Seal Beach, Calif.

Filed Nov. 25, 1968, Ser. No. 778,487
Int. Cl. H01q 13/10
U.S. Cl. 343—770 5 Claims



An antenna having a rectangular sheet of metal foil with parallel spaced slots formed therein. The slotted sheet serves as a radiator operating in the UHF band. The metal sheet is enclosed between overlying and underlying plastic sheets

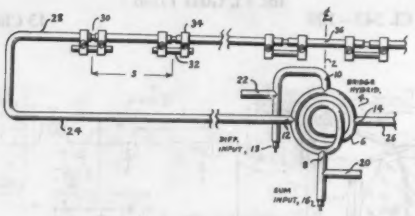
which are heat sealed to the metal sheet. The composite laminate structure is flexible thus permitting the rolling thereof.

3,577,197

SLOTTED CABLE LOCALIZER ANTENNA

Chester B. Watts, Jr., 6505 Pinecrest Court, Annandale, Va.

Filed Sept. 4, 1969, Ser. No. 855,142
Int. Cl. H01q *13/10*
U.S. Cl. 343—771 **4 Claims**



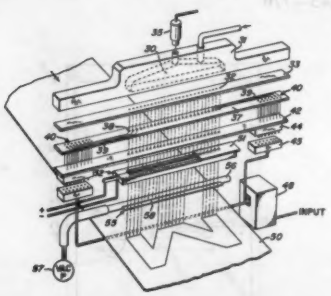
This invention relates to antennas for simultaneous transmission of sum and difference patterns as in a runway localizer for instrument landing of airplanes. A straight horizontal run of coaxial cable, placed centrally perpendicular to the extension of the runway centerline, is symmetrically fed from both ends by an RF bridge in sum and difference modes. The outer conductor of the cable is periodically interrupted by slots which permit currents to flow on the outside of the outer conductor. The antenna current distributions corresponding to the two modes are controlled by low-resistance shunts placed across the slots and by the relationship between the slots spacing and the internal guide-wavelength. To maintain the relationship over the 4 percent band of localizer frequencies, the guide-wavelength is adjusted always to the same value by filling the cable with the necessary quantity of a gas of relatively high-dielectric constant.

3,577,198

CHARGED DROP GENERATOR WITH GUARD SYSTEM

Dale R. Beam, Chillicothe, Ohio, assignor to The Mead Corporation, Montgomery County, Ohio

Continuation-in-part of application Ser. No. 782,048, Dec. 9, 1968, now abandoned. This application Nov. 24, 1969, Ser. No. 879,131
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 **1 Claim**



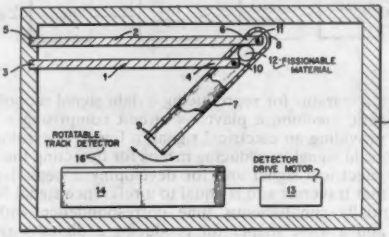
In apparatus for selectively charging of individual drops in a liquid stream or fluid filament divided into drops, a grounded guard electrode surrounds the stream between a charging electrode and a set of electrodes which create a deflection field. This isolates the fluid filament tip from the deflecting electrodes and avoids induced charges on it from the deflection field.

3,577,199

MEASURING IRRADIATION-INDUCED DEFORMATIONS OF MATERIALS

Warner W. Schultz, Schenectady, N.Y., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 22, 1969, Ser. No. 852,360
Int. Cl. G01t *3/00, 5/00*
U.S. Cl. 250—83.1 **8 Claims**



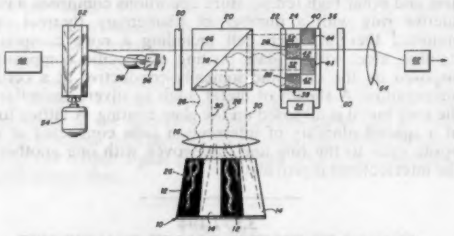
This invention relates to a method and apparatus for measuring irradiation-induced change in length of a test sample. Neutron irradiation produces a differential change in length between the lengths of a test sample and a comparison standard. Mechanical pivot means are provided for magnifying the differential change in length. Means including a source of fissionable material and a track detector surface are provided for recording the magnified differential change in length.

3,577,200

REAL-TIME SOLID STATE CAMERA SYSTEM

Ralph E. Aldrich, Arlington, and Paul J. Caruso, Bedford, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Sept. 12, 1968, Ser. No. 759,360
Int. Cl. H04n *3/10*
U.S. Cl. 178—7.1 **13 Claims**



Camera apparatus is disclosed for sensing the pattern of modulation imposed by an electro-optic medium on radiation as a function of the electric field established across the electro-optic medium by the effect of a radiant image projected on a photoconductor medium associated with the electro-optic medium across which mediums an electric field has been established.

3,577,201

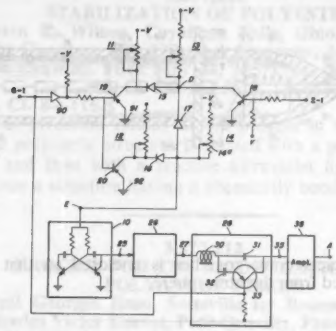
PORTABLE COMPUTER TERMINAL

Jesse T. Quatse, Pittsburgh, Pa., and Brook Dixon, Seldon, N.Y., assignors to Vernitron Corporation, Farmingdale, N.Y.

Filed Jan. 8, 1968, Ser. No. 696,174
Int. Cl. H04m *11/06*
U.S. Cl. 179—2DP **5 Claims**

The invention is concerned with a logic decoder means which senses a signal indicative of whether a teletype machine or a computer originates a communicative line between a portable computer terminal and the computer. The modulator and demodulator within the portable terminal computer operate in different frequency bands and have

filter networks adapted to be switched into circuit with the information signals, in response to output signals from the

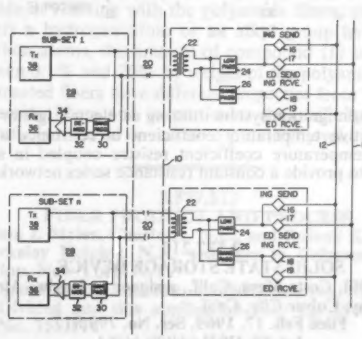


logic decoder and thereby set the respective frequency bands in the modulator and demodulator.

3,577,202
TELEPHONE HYBRID ARRANGEMENT WITH FREQUENCY SEPARATION FOR USE WITH TDM SYSTEMS

Barrie Brightman, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed July 6, 1967, Ser. No. 651,568
Int. Cl. H04j *1/06*
U.S. Cl. 179—15A **6 Claims**



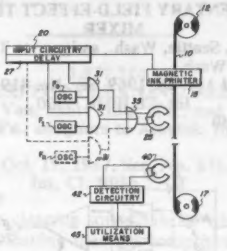
A telephone hybrid system for use with a TDM switching center including filter arrangements at the center and at the subscriber subsets, which serve as hybrid circuits to establish directivity of signalling. A carrier signal at the frequency of the TDM frame rate and derived from the TDM system is used to transmit signals from the switching center to the subsets, thus enabling directional separation by simple filtering.

3,577,203
CHARACTER RECORDING AND RECOGNITION SYSTEM

Kenneth M. Beach, Jr., Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Apr. 18, 1968, Ser. No. 722,293
Int. Cl. G06k *7/08, 9/18*
U.S. Cl. 235—61.11 **7 Claims**

A system for automatically reading alphanumeric characters recorded on a document wherein the symbols are shaped so as to be also recognizable by human beings. The apparatus comprises a transport for advancing a document strip past a plurality of stations which include a marking station at which magnetic material is applied as alphanumeric characters in response to discrete signals, a recording station at which flux patterns associated with the characters are impressed in superposed relationship therewith in response to frequency signals, and frequency signals in timed relation to the move-



ment of the document. The magnetic material may have an electrostatic component to enable electrostatic recording or may comprise magnetic particles in solid or liquid form. A detection circuit is provided for reading out the character frequency patterns and supplying this information in signal form to a utility device.

3,577,204
NOVEL PHOTOGRAPHIC PROCESS OF DIFFUSION TRANSFER OF X-RAY IMAGE WITH PHOSPHORESCENT LUMINOPHOR

Joel M. Peisach, Hudson, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

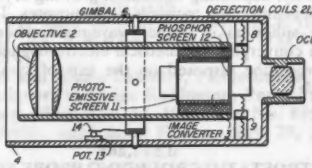
No drawing. Filed Mar. 17, 1967, Ser. No. 623,990
Int. Cl. G01n *21/34*
U.S. Cl. 250—65 **6 Claims**

X-ray exposures may be reduced by using a film containing an integral X-ray intensifier screen composed of phosphorescent luminophors, and intensifying the latent image by actinic radiation emitted after the X-ray exposure has ceased. The thus exposed and intensified film is diffusion transfer processed to provide a silver transfer image.

3,577,205
AUTOMATIC IMAGE MOTION STABILIZATION SYSTEM

Gilbert L. Hobrough, Woburn, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Nov. 19, 1965, Ser. No. 508,779
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 **5 Claims**



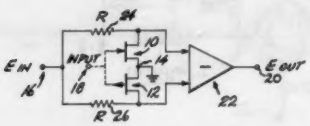
An image motion stabilization system for use with telescopes, cameras, and the like. An inner casing containing an objective lens and an image converter is mounted within an outer support casing so as to be movable with respect thereto. Displacement of the outer casing with respect to the

inner casing caused by vibration or movement produces a corresponding displacement of the electron stream in the image converter such that a stable image of a scene viewed by the objective lens will be presented to an ocular in the outer casing.

3,577,206
COMPLEMENTARY FIELD-EFFECT TRANSISTOR MIXER

Philip J. Ferrell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 28, 1969, Ser. No. 819,591
Int. Cl. H03k *17/00*
U.S. Cl. 307—240 **7 Claims**

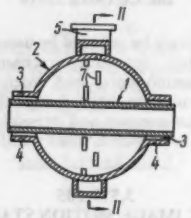


A pair of complementary field-effect transistors with common source connections are connected with a first input signal identically common to both drains and a second input signal identically common to both gates so as to give a mixed first and second signal output through a balanced subtractor connected between the drains.

3,577,207
MICROWAVE PLASMATRON

Vladimir Pavlovich Kirjushin, ulitsa Sovetskaya 1-a, kv.5., Fryazino, U.S.S.R.

Filed May 7, 1969, Ser. No. 822,450
Int. Cl. H01j *7/46, 19/80*
U.S. Cl. 315—39 **4 Claims**



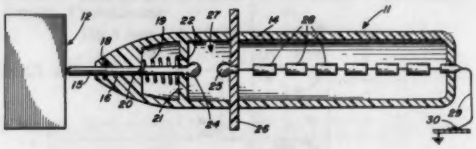
A device for producing low-temperature plasma of microwave discharge at atmospheric pressure of a plasma-forming gas suitable for conducting chemical reactions of extreme purity, depositing thin films, growing crystals, producing powders and other technological purposes. The device includes a spherical or radial waveguide wherein there is excited a converging symmetrical electromagnetic wave, and a discharge tube disposed on the axis of symmetry of the waveguide.

3,577,208
ELECTROSTATIC GROUNDING PROBE FOR USE IN EXPLOSIVE ATMOSPHERES

John T. Petrick, Fredericksburg, Va.

Filed July 3, 1969, Ser. No. 838,923
Int. Cl. H01r *3/06;* **H05f**
U.S. Cl. 317—2R **6 Claims**

A grounding probe having a stationary contact connected to ground through a high resistance. A movable contact is normally biased away from the stationary contact but can be moved adjacent the stationary contact by pressing it against the object to be grounded. The area where stationary and

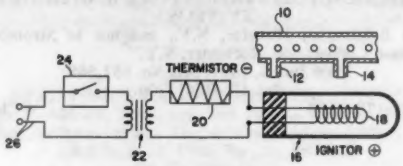


movable contacts come together is enclosed so that any spark is isolated from the atmosphere.

3,577,209
ELECTRIC IGNITION SYSTEM

Charles H. Perkins, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 28, 1969, Ser. No. 803,297
Int. Cl. F23g *7/10*
U.S. Cl. 317—98 **4 Claims**

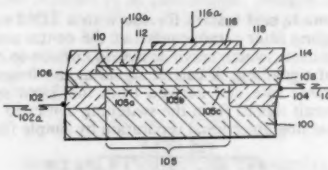


An electric ignition system utilizing an electric ignitor having a positive temperature coefficient of resistance and a negative temperature coefficient resistor coupled in series therewith to provide a constant resistance series network.

3,577,210
SOLID-STATE STORAGE DEVICE

Hans G. Dill, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 17, 1969, Ser. No. 799,817
Int. Cl. H01l *11/00, 11/14*
U.S. Cl. 317—235 **30 Claims**



A solid-state storage device in the form of an insulated gate field effect tetrode. A depletion region is created in the channel so that an electric field emanating from one gate can penetrate the channel and attract high energy charge carriers into traps in the insulator. The charge carriers enter the insulator by surmounting the Schottky barrier at the semiconductor-insulator interface.

CHEMICAL

3,577,211
STABILIZATION OF POLYESTERS

Warren K. Wilson, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed May 22, 1967, Ser. No. 640,403
Int. Cl. D06m *13/12, 13/16*
U.S. Cl. 8—115.5 **3 Claims**

This invention relates to the process in which an organic polymeric structure is treated with a polyacid chloride and then with a reactive ultraviolet light stabilizer to form a structure having a chemically bonded stabilizer.

3,577,212
PROCESS FOR THE MODIFICATION OF POLYAMIDE FIBERS

Marcel Georges Jirou, Sotteville les Rouen, and Pierre Charles Victor Bouvet, Petit-Quevilly, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Aug. 7, 1967, Ser. No. 658,613
Claims priority, application France, Aug. 8, 1966, 72,363
Int. Cl. D06p *3/34*
U.S. Cl. 8—115.5 **7 Claims**

Process for the modification of synthetic polyamide fibers which comprises treating the fibers at a pH of from 3 to 11 inclusive and at a temperature of from 40° C. to the boiling temperature of the bath with a compound of the formula:

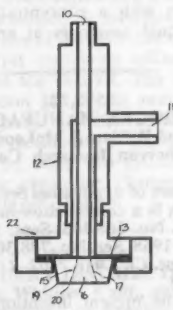
$$A_1-SO_2-N(R)-W \quad (I)$$

in which A_1 represents a non-colouring, aliphatic, aromatic or heterocyclic radical, W represents the residue of an acylating agent carrying an atom or group of atoms capable of reacting with the polyamide fibers, and R represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, the amount of compound (I) used being between 0.1% and 20% by weight of the polyamide fibers. The treated fibers have different properties from untreated polyamide fibers and in particular their affinity for acid dyestuffs is reduced or rendered practically nil.

3,577,213
FIBER PRODUCT AND PROCESS

William J. Myles, Charlotte, N.C., and Roland K. Kunkel, Berkeley Heights, N.J., assignors to Celanese Corporation, New York, N.Y.

Original application Jan. 4, 1965, Ser. No. 423,137. Divided and this application July 12, 1968, Ser. No. 758,174
Int. Cl. D06m *1/100*
U.S. Cl. 8—130 **3 Claims**



A process comprising preparing filaments each of which contains at least two segments in eccentric relationship in its cross-section all along its length, one of said segments being a saponifiable cellulose ester containing quaternary ammonium salt dispersed throughout its interior and the other segment being a cellulose ester free of quaternary ammonium salts.

3,577,214
PROCESS FOR CLEANING FABRICS

Ambrose E. Le Van, Short Hills, N.J., and David Tatum, Swarthmore, Pa., assignors to Ametek, Inc., New York, N.Y.

Filed Oct. 19, 1967, Ser. No. 676,503
Int. Cl. B08b *7/04*
U.S. Cl. 8—137 **9 Claims**

A process for cleaning soiled fabrics which utilizes an apparently dry cleaning medium comprising a finely particulate carrier adsorbed with a cleaning liquid. The soiled fabric is placed into a plenum containing the cleaning medium and the medium is fluidized by directing an air stream through the plenum. Differential motion is applied by transducer means to the particulates of the medium while the fabric is in the plenum. The foreign material carried by the fabric is transferred to the cleaning medium due to the scouring action of the medium. The apparatus for the process comprises an enclosure having within it the mentioned plenum, means for retaining the soiled fabric within the plenum and means for directing an air stream through the cleaning medium to fluidize the cleaning medium and thereafter to recirculate the air stream. Transducer means applies a differential motion to the particulates to aid in the cleaning action.

3,577,215
DRY CLEANING PROCESS

Ector P. Impullitti, Detroit, Mich., assignor to F. W. Means & Company, Chicago, Ill.

Filed Feb. 3, 1969, Ser. No. 796,069
Int. Cl. D06l *1/02*
U.S. Cl. 8—142 **10 Claims**

Oil impregnated textile cleaning utensils can be cleaned and prepared for reuse in a single brief operation by using a petroleum mineral oil as the cleaning medium. The utensils are cleaned by placing them into the wheel of a commercial dry cleaning apparatus then adding an excess of oil beyond that necessary to saturate the utensils at a temperature between 60–250° F. and agitating the wheel for about 15 minutes. The oil is drained off and the utensils are spun to remove excess oil but leave about 20 to 40 wt. percent oil in the utensil based on the weight of the clean, dry utensil or implement.

3,577,216
PROCESS FOR THE RECOVERY OF SELENIUM IV UTILIZED AS A CATALYST FOR OXIDATION REACTIONS

Francis Weiss and Andre Lakodey, Pierre-Benite, Rhone, France, assignors to Ugine Kuhlmann, Paris, France

No Drawing. Filed Nov. 24, 1967, Ser. No. 685,282
Claims priority, application France, Nov. 29, 1966, 85,385
Int. Cl. C01b *19/00*
U.S. Cl. 23—50 **11 Claims**

A process for the recovery of selenium IV which has been used as a catalyst in the oxidation of organic compounds by oxygen, hydrogen peroxide, or organic peroxides which comprises precipitating a metal selenite from the reaction environment or medium at the end of the

oxidation process, separating the precipitated metal selenite from the medium and extracting therefrom selenious acid or anhydride which may be recycled.

3,577,217

PROCESS FOR RECOVERING A CHROMATE AND CUPRIC OXIDE BY DECOMPOSITION OF A CATALYST OR WASTE CATALYST OF COPPER CHROMITE

Takuo Machida, Takarazuka-shi, and Masataka Nakagawa, Yamato-Takada-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,984
Int. Cl. C01g *37/14, 3/02*
U.S. Cl. 23—56 **2 Claims**

A process is provided for recovering a chromate and cupric oxide by decomposition of a catalyst or waste catalyst of copper chromite mainly represented by the formula

$$CuO \cdot CuCr_2O_4$$

which comprises the steps of

(a) mixing said catalyst or waste catalyst with an alkali metal compound of the formula

$$(M)_n(B)_m$$

wherein

M is an alkali metal selected from sodium and potassium;

B is an oxygen atom, a carbonic radical, a bicarbonic radical or a hydroxy radical; and

each *m* and *n* is either 1 or 2, dependent upon the respective valences of M and B;

(b) heating the resultant mixture of (a) at a temperature of from 300° C. to 1200° C. in the presence of oxygen or a molecular oxygen-containing gas; and

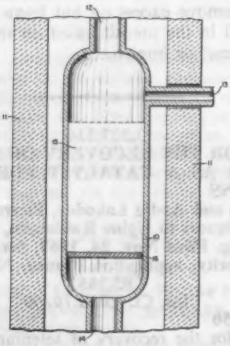
(c) mixing the resultant mixture of (b) with water to recover cupric oxide as an insoluble solid and a chromic acid salt of said alkali metal as an aqueous solution.

3,577,218

METHOD FOR THE PRODUCTION OF HYDROGEN CYANIDE WHEREIN PLATINIZED MULLITE SERVES AS A CATALYST

Patrick M. Brown, Catonsville, and Heyman C. Duecker, Rockville, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 28, 1968, Ser. No. 755,938
Int. Cl. C01c *3/02*; B01j *9/04*
U.S. Cl. 23—151 **3 Claims**



A mixture of ammonia and methane is reacted over platinized mullite catalyst to give high yields of hydrogen cyanide. The catalyst is prepared by depositing platinum on either natural or synthetic mullite; it possesses improved stability and avoids the problem of carbonitridation frequently encountered in use of alumina as a catalyst support in the production of hydrogen cyanide.

3,577,219

RECOVERY OF SULFUR DIOXIDE FROM WASTE GASES

Indravadan S. Shah, Forest Hills, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,547
Int. Cl. C01b *17/72*; C01f *5/42*
U.S. Cl. 23—168 **12 Claims**

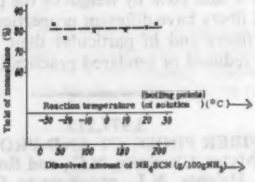
A process is provided to efficiently and economically absorb and recover sulfur dioxide from a waste gas stream such as the tail gas from a sulfuric acid facility, or flue gas from the combustion of a sulfur-containing fuel. The process thus eliminates air pollution, and produces a useful sulfur-containing product from the recovered sulfur dioxide. The waste gas stream is scrubbed with a recirculating aqueous slurry containing magnesium oxide and magnesium sulfite. A small quantity of magnesium sulfate may be present if formed as a result of oxidation of magnesium sulfite or absorption of sulfur trioxide.

3,577,220

PROCESS FOR PRODUCTION OF MONOSILANE (SiH_4) AND GERMANIUM HYDRIDE (GeH_4)

Tatsuo Kuratomi, 4–2–18 Hamatake, Chigasaki, and Yoshifumi Yatsurugi, 6–507, 7–2-chome, Tsujido Nishikaigan, Fujisawa, both of Kanagawa, Japan

Filed Oct. 29, 1968, Ser. No. 771,405
Claims priority, application Japan, Oct. 31, 1967, 42/69,592
Int. Cl. C01b *33/04*; C22b *41/00*
U.S. Cl. 23—204 **9 Claims**



A process for producing monosilane (SiH_4) comprising reacting magnesium silicide with a concentration of ammonium thiocyanate in liquid ammonia at ambient temperature and pressure. Also, a process for producing germanium hydride (GeH_4) comprising reacting magnesium germanide with a concentration of ammonium thiocyanate in liquid ammonia at ambient temperature and pressure.

3,577,221

HYDROGEN MANUFACTURE

Calvin S. Smith and William J. McLeod, El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

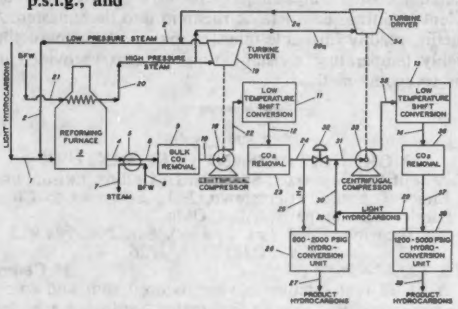
Continuation-in-part of application Ser. No. 736,520, May 17, 1968, which is a continuation-in-part of abandoned application Ser. No. 665,106, Sept. 1, 1967. This application Dec. 31, 1968, Ser. No. 788,300
Int. Cl. C01b *1/02, 1/18*
U.S. Cl. 23—213 **7 Claims**

According to the present invention a process is provided for producing high pressure hydrogen which comprises:

(a) generating a hydrogen-rich gas stream containing CO and CO_2;

(b) removing CO_2 from the hydrogen-rich gas stream to obtain a CO_2 lean, hydrogen-rich gas stream;

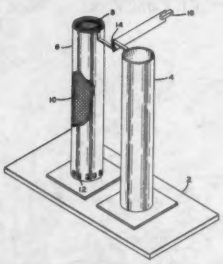
(c) centrifugally compressing the CO_2-lean, hydrogen-rich gas stream to a pressure of above about 400 p.s.i.g.; and



(d) reacting CO contained in the CO_2-lean, hydrogen-rich gas stream with H_2O at a pressure of above about 400 p.s.i.g.

Preferably CO_2 is removed from the hydrogen obtained after step (d) and the purified compressed hydrogen is used in a hydroconversion process.

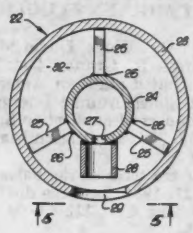
3,577,222
CARBON MONOXIDE DETECTOR
John M. Ward, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Nov. 15, 1968, Ser. No. 776,011
Int. Cl. G01n *31/10*
U.S. Cl. 23—254 **3 Claims**

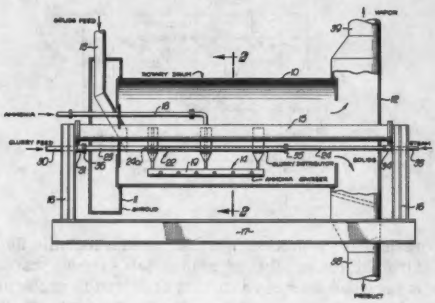


The carbon monoxide detector comprises two parallel mounted cylinders of metal having a high coefficient of linear expansion and spaced apart from one another on a common base. A chemical catalyst of the type capable of generating heat when exposed to a minimal concentration of carbon monoxide is mounted within a porous tube placed within one of the cylinders. Free air is allowed to enter the catalyst containing cylinder from its base and circulate about the catalyst. The heat generated by the catalytic reaction of carbon monoxide in air will cause the linear expansion of the cylinder thereby closing the microswitching mechanism mounted partly at the top of each cylinder. By using two cylinders having a high coefficient of linear expansion, changes in ambient temperature may be compensated for.

3,577,223
SLURRY DISTRIBUTOR
Alan Longacre, Whittier, Calif., assignor to Fluor Corporation, Los Angeles, Calif.
Filed Aug. 11, 1969, Ser. No. 849,096
Int. Cl. B01j *2/12*
U.S. Cl. 23—259.1 **10 Claims**

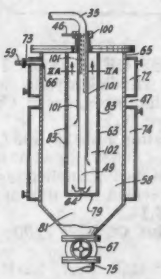
Partially ammoniated phosphoric acid slurry is distributed onto a bed of ammonium phosphate granules by a tubular distributor comprising concentric pipes spaced to provide a passage for the slurry which is





aspirated by steam discharged from the inner pipe through nozzles spaced from and alined with countersunk openings in the outer pipe.

3,577,224
APPARATUS FOR PRODUCTION OF HIGH PRESSURE POLYETHYLENE
Martin Hess, Pittsburgh, and Lawrence Saroff, Carnegie, Pa., assignors to Sinclair-Koppers Company
Filed Sept. 9, 1968, Ser. No. 758,315
Int. Cl. B01j *9/08*; C08f *1/60, 3/04*
U.S. Cl. 23—285 **3 Claims**



An improved method and apparatus is provided for production of high pressure polyethylene in a sparger tube reactor. Cold ethylene gas is radially injected into the polymerization zone in variable amounts at spaced increments. Catalyst-rich gas is also injected into the polymerization zone at spaced increments in variable amounts with respect to the cold ethylene gas injection. Injection of both cold ethylene gas and catalyst-rich gas, at spaced increments and in various amounts with respect to each other provides control of reaction and, therefore, of temperature profile. Thus, an essentially constant temperature and pressure profile can be maintained throughout the polymerization zone.

3,577,225

METHOD FOR SEPARATING URANIUM, PROTACTINIUM, AND RARE EARTH FISSION PRODUCTS FROM SPENT MOLTEN FLUORIDE SALT REACTOR FUELS

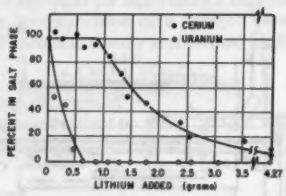
James H. Shaffer, Oak Ridge, David M. Moulton, Knoxville, and Warren R. Grimes, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Continuation-in-part of application Ser. No. 745,837, July 18, 1968. This application May 15, 1969, Ser. No. 824,944

The portion of the term of the patent subsequent to Oct. 21, 1986, has been disclaimed

Int. Cl. C22b *61/04*

U.S. Cl. 23—325 5 Claims



A method for reprocessing spent molten metallic fluoride salt mixtures suitable as molten salt breeder reactor fuels is provided whereby uranium and bred-in protactinium values as well as certain fission products of the lanthanide series are selectively and consecutively extracted from the salt phase into an immiscible molten bismuth solution by controlling the reduction potential between the metal and salt phases. Uranium values, which are extracted first, are oxidized and transferred from the bismuth solution into a barren salt mixture for ultimate recycle to the reactor prior to extracting the contaminants. The protactinium values are then extracted at a slightly higher reduction potential into the bismuth solution, oxidized, and transferred to a molten salt outside the reactor enviroment to await decay of the protactinium-233 to uranium-233. Finally, the lanthanide elements are extracted at a yet higher reduction potential into the bismuth solution, oxidized, and transferred to a separate salt mixture for their recovery or disposal.

3,577,226

METAL BODIES OF UNIFORM POROSITY

Raymond J. Elbert, Middleburg Heights, and Ernest G. Farrier, Parma, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Application June 30, 1967, Ser. No. 650,250, now Patent No. 3,433,632, dated Mar. 18, 1969, which is a continuation-in-part of application Ser. No. 484,123, Aug. 31, 1965. Divided and this application Feb. 10, 1969, Ser. No. 798,142

Int. Cl. B22f *1/00*

U.S. Cl. 29—182 2 Claims

Sintered porous metal sheet, having not more than about one pore per twenty-five (25) square feet of sheet with a size larger than three times the average pore size of said sheet.

3,577,227

TUNGSTEN MATERIALS AND A METHOD FOR PROVIDING SUCH MATERIALS

Gail F. Davies, Mentor, Ohio, assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 4, 1968, Ser. No. 766,038

Int. Cl. C22c *15/00*

U.S. Cl. 29—182 2 Claims

A method for shaping and forming metallic tungsten by coating tungsten particles with a minor amount of metallic rhenium and thereafter compacting and partially sintering said coated particles. A method for providing intricate shapes of high temperature resistant, non-ductile tungsten by re-sintering said compacted and sintered rhenium coated tungsten particles at a temperature sufficient to diffuse the metallic rhenium into the tungsten. A ductile, readily formable tungsten mass and a non-ductile, highly temperature resistant, tungsten mass provided by the foregoing methods.

3,577,228

SMOKE SUPPRESSANT FUEL MIXTURE

Charanjit Rai, Somerset, Sherman D. Collins, Edison, and Elmer J. Badin, Hightstown, N.J., assignors to Cities Service Oil Company, Tulsa, Okla.

No Drawing. Filed Jan. 3, 1969, Ser. No. 788,922

Int. Cl. C10l *1/18, 1/26*

U.S. Cl. 44—76 25 Claims

A liquid fuel mixture having reduced soot and smoking characteristics comprises a major portion of a hydrocarbon fuel and a minor portion of a Group II–A metal organyl orthophosphate. Preferably, a barium salt of a dialkyl orthophosphoric acid is employed in amounts from about 0.1 to 2% by weight. Further improvement results when an ether, particularly a glycol ether, is additionally incorporated into the orthophosphate and fuel mixture.

3,577,229

METHOD AND APPARATUS FOR MAKING FERTILIZER

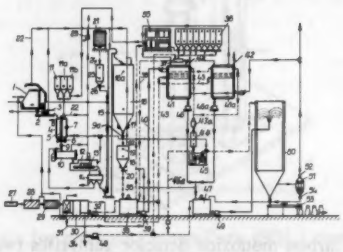
Hans-Erwin Brück, 16 Gartenfeldstr., 55 Trier, Germany

Filed Dec. 26, 1968, Ser. No. 786,984

Claims priority, application Germany, Feb. 23, 1968, P 16 67 788.6

Int. Cl. C05f *7/00*

U.S. Cl. 71—9 15 Claims



In producing a spreadable grain size fertilizer from a mixture of garbage and fecal matter the garbage is treated to place it in a relatively small grain size after any metallic and fibrous materials have been removed, and the fecal matter, such as in a sewage system, is treated to remove solids, fats and detergents. The treated garbage and fecal matter is mixed as a sludge and is biologically fermented after which water is added to the fermented sludge. After a drying and granulating operation, the fermented sludge is bagged for use as a fertilizer.

3,577,230

PROCESS OF APPLYING NOVEL ALGICIDES

Edward Helmut Sheers, Flushing, N.Y., assignor to Arizona Chemical Company, New York, N.Y.

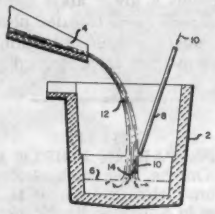
No Drawing. Filed Oct. 18, 1968, Ser. No. 768,919

Int. Cl. A01n *9/26*

U.S. Cl. 71—67 3 Claims

A method for destroying or inhibiting microorganisms by contacting them with a trans-hydroxy-stilbene derivative, and a composition comprising said stilbene.

3,577,231
PROCESS FOR PREPARING METAL SULFIDES
Marvin Pesses, Youngstown, Ohio, assignor to Mercer Alloys Corporation
Filed Aug. 23, 1968, Ser. No. 754,811
Int. Cl. C01g 3/12, 51/00, 53/00
U.S. Cl. 75—1 4 Claims



A process for producing a concentrate of metallic sulfides (especially nickel sulfide, copper sulfide and cobalt sulfide) from metallic scrap materials. The scrap materials are melted under a reducing atmosphere and injected with sulfur-bearing material during the pouring of the molten material from the melting furnace to a ladle. Thereafter, the molten mixture of sulfides is rapidly cooled and subdivided to produce a homogeneous, friable, synthetic ore.

3,577,232
REMOVING NICKEL FROM CADMIUM
John A. Ruppert, Edgewood Farms, Ellicott City, Md. 21042, and Dominic Montagna, 6144 31st St. NW., Washington, D.C. 20015
No Drawing. Filed May 29, 1969, Ser. No. 829,092
Int. Cl. C22b 9/10, 17/00, 23/00
U.S. Cl. 75—71 10 Claims

A molten halide flux is formed on top of a metallic melt of nickel-contaminated cadmium. Phosphorus is then added to the flux, and the phosphorus ingests into the metallic melt through the flux-metal interface to react with the nickel so as to form insoluble nickel-phosphorus compounds which are then removed from the molten cadmium.

3,577,233
HIGH TEMPERATURE BRAZING ALLOYS
Nicholas T. Gamer, Palo Alto, Calif., assignor to Western Gold & Platinum Company
No Drawing. Filed Sept. 10, 1968, Ser. No. 758,705
Int. Cl. C22c 5/00
U.S. Cl. 75—134 11 Claims

Brazing alloys comprising in percent by weight 25–70% gold, 5–30% palladium, 15–40% nickel, 4–12% chromium and .01 to 2% yttrium. These alloys exhibit substantial ductility and high oxidation and corrosion resistance at service temperatures of 1600–1800° F. and above continuously for 100 hours or more and therefore having particular utility in joining stainless steel and superalloys in aircraft and space craft engines and components. The addition of up to about 2% by weight of tungsten, tantalum or molybdenum to these alloys further improves their high temperature strength.

3,577,234
BRAZING ALLOYS
John D. Boughton, Philip M. Roberts, and Meczyslaw Herman Sloboda, London, England, assignors to Johnson, Matthey & Co. Limited, London, England
No Drawing. Filed Aug. 4, 1967, Ser. No. 658,350
Claims priority, application Great Britain, Aug. 18, 1966, 37,053/66
Int. Cl. C22c 9/06; B32b 15/20
U.S. Cl. 75—159 4 Claims

This invention relates to a brazing alloy suitable for the fluxless brazing of steels (unalloyed and alloy steels including stainless steel). The brazing alloy consists essentially of 0.5–10% nickel, 0.01–0.05% boron and the balance copper.

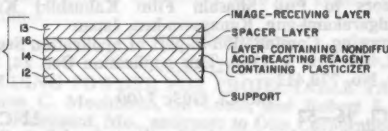
3,577,235
ELECTROPHOTOGRAPHIC COMPOSITION AND ELEMENT
Lawrence E. Contois, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 754,499, Aug. 21, 1968. This application Feb. 17, 1969, Ser. No. 799,917
Int. Cl. G03g 5/08, 5/06
U.S. Cl. 96—1.6 10 Claims

4-aminobenzo[b]pyrylium and 4 - aminobenzo[b]thiapyrylium salts are sensitizers for organo-metallic photoconductors. Photoconductive compositions sensitized with these compounds have increased electrophotographic speed and are sensitive in the ultraviolet region of the spectrum.

3,577,236
COLOR DIFFUSION TRANSFER PROCESSES AND ELEMENTS COMPRISING AUXILIARY DEVELOPERS OR THEIR PRECURSORS
Delbert D. Fix, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Sept. 29, 1969, Ser. No. 861,997
Int. Cl. G03c 7/00, 5/30
U.S. Cl. 96—3 28 Claims

Improved minimum print densities are produced in color diffusion transfer systems by processing in the presence of a lactone derivative silver halide developing agent, such as a coumarin derivative, which has the property of forming a lactone developing agent precursor under acid, neutral and slightly alkaline conditions.

3,577,237
DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS AND PROCESSES COMPRISING ACID-REACTING REAGENTS AND POLYETHER BLOCK COPOLYMERS AS PLASTICIZERS THEREFOR
Lloyd D. Taylor, Everett, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Sept. 23, 1968, Ser. No. 761,772
Int. Cl. G03c 7/00, 5/54
U.S. Cl. 96—3 27 Claims



Plasticization of the layer of a diffusion transfer image-receiving sheet containing an acid-reacting reagent may be accomplished by incorporating therein a compound selected from the group consisting of block polyether compounds of the formulae:

$$-\left(RO\right)_x\left(R_1O\right)_y- \text{ and}$$

$$\left(RO\right)_x\left(R_1O\right)_y \diagdown \quad \diagup \left(RO\right)_x\left(R_1O\right)_y$$
$$NR_3N$$
$$\left(RO\right)_x\left(R_1O\right)_y \diagup \quad \diagdown \left(RO\right)_x\left(R_1O\right)_y$$

where R, R_1 and R_3 are alkylene groups and x and y are integers representing the molar ratio of respective blocks. Concomitant with the plasticization effect increased temperature latitude is imparted to the system.

3,577,238

FERROCENE DYES AND PHOTOGRAPHIC ELEMENTS

Jacque K. Lindsay, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Mar. 28, 1969, Ser. No. 811,567
Int. Cl. G03c *1/64*; G03f *7/10*
U.S. Cl. 96—28 9 Claims

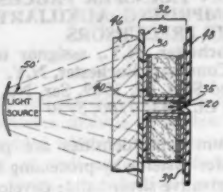
Light-sensitive ferrocene dyes are prepared by condensing formylferrocene or a vinylog thereof such as formylvinylferrocene with a heterocyclic reagent in an alkaline medium. The dyes so prepared are light-sensitive and operate to harden or tan gelatin upon exposure to light.

3,577,239

METHOD OF PHOTOGRAPHICALLY PRODUCING PLATED-THROUGH HOLES IN PRINTED CIRCUIT BOARDS

Matthew W. Lesnieski, Bloomingdale, N.J., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 16, 1968, Ser. No. 783,924
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.2 4 Claims



Production of plated-through holes in printed circuit cards by drilling holes at predetermined locations in a base material, plating the interior hole surfaces with a thin layer of conductive metal, coating with a layer of photoresist, vacuum-drawing portions of a flexible metal foil into the holes, and exposing the photo-resist and foil to light, whereby the photo-resist covering the interior surfaces of the holes is properly exposed.

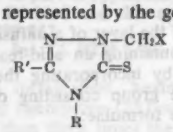
3,577,240

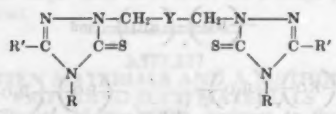
DIFFUSION TRANSFER PHOTOGRAPHIC MATERIALS

Fumihiko Nishio, Odawara-shi, and Reiichi Ohi and Tatsuyo Tajima, Minamiashigara-machi, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Ashigarakami-gun, Kanagawa-ken, Japan

No Drawing. Continuation-in-part of application Ser. No. 431,453, Feb. 9, 1965. This application Oct. 24, 1968, Ser. No. 770,412
Int. Cl. G03c *7/00*
U.S. Cl. 96—52 12 Claims

A toning agent represented by the general formula





wherein R and R_1 each represents a hydrogen atom, a lower alkyl group or an aryl group; X represents a hydroxyl group and

(where R_1 and R_2 each represents a lower alkyl group or aryl group and R_1 and R_2 may together complete a heterocyclic ring); and Y represents

(where R_3 represents a lower alkyl group or an aralkyl group), is used in diffusion transfer photographic material to give deep black images or printings on a positive material in diffusion transfer photography.

3,577,241

METHOD OF PREPARING EDIBLE ANIMAL FEET

Ray H. Means, Omaha, and Michael Kussman and Jack Wade, Papillion, Nebr., and Victor H. Vodra, Denver, Colo., assignors to American Beef Packers, Inc., Omaha, Nebr.

No Drawing. Filed Apr. 10, 1969, Ser. No. 815,224
Int. Cl. A22c *18/00*
U.S. Cl. 99—7 9 Claims

A new process for preparing edible animal feet (particularly cattle and horses' feet) cleans and dehairs the feet mechanically by scalding the same in a hot caustic wash in a mechanical washing machine to remove dirt and hair from the feet; the cleaned and dehaired feet are bleached in a sodium percarbonate treatment at a lower temperature than the scald, and the resulting feet are rinsed and neutralized in non-toxic acid rinse solution.

3,577,242

ANTEMORTEM METHOD OF TENDERIZING MEAT

Edwin P. Jenevein, Jr., 7036 Town N., Dallas, Tex. 75231

No Drawing. Filed June 6, 1966, Ser. No. 555,289
Int. Cl. A22c *18/00*
U.S. Cl. 99—107 6 Claims

An antemortem method of tenderizing meat by administering to an animal before slaughter a collagen diminution agent (an agent which will destroy and/or inhibit collagen formation, but will not materially attack muscle cells in the subject animal), and allowing the collagen diminution agent to assimilate within the animal before it is slaughtered.

3,577,243

PROCESS OF EXTRACTING MEAT FROM CRABTAILS

Peter W. Bynagte, San Diego, Calif., assignor to Westgate-California Foods, Inc., San Diego, Calif.

No Drawing. Filed Oct. 17, 1968, Ser. No. 768,503
Int. Cl. A22c *29/00*; A23l *1/33*
U.S. Cl. 99—111 5 Claims

The process of extracting the meat from crabtails wherein the crabtails are dipped into a solution of salt water, sodium acid pyrophosphate or calcium acid pyrophosphate and sodium tripolyphosphate for a period of at least two minutes during which time the solution is agitated and then removing the meat from the crabtails and precooking the meat in boiling water.

3,577,244

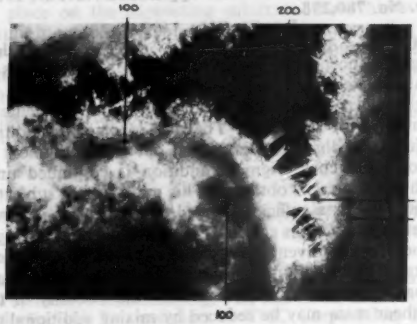
PRESERVATION OF LIMESTONE STRUCTURES

Seymour Z. Lewin, New York, N.Y., assignor to New York University, New York, N.Y.

Continuation-in-part of application Ser. No. 529,213, Feb. 23, 1965. This application Dec. 19, 1968, Ser. No. 785,316
Int. Cl. C09k *3/10*
U.S. Cl. 106—12 20 Claims

This application is directed to a process and composition for preserving stone objects having at least 10%

calcium carbonate by maintaining the stone in contact with an aqueous solution for a sufficient period of time to



improve the weathering properties of the stone. One embodiment includes applying a solution of barium hydroxide, urea, glycerin and water to the stone.

3,577,245

BORON NITRIDE ARTICLE HAVING IMPROVED THERMAL STABILITY

Herbert C. Quandt, Lakewood, Ohio, assignor to Union Carbide Corporation

No Drawing. Filed Nov. 3, 1967, Ser. No. 680,330
Int. Cl. C04b *33/00*; C01b *21/06*
U.S. Cl. 106—39 **5 Claims**

Method of improving the high temperature stability of boron nitride articles by treatment with calcium cyanamide.

3,577,246

REFRACTORY SHAPE WITH PREREACTED GRAIN

Joseph E. Neely, Los Gatos, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,764
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 **8 Claims**

A refractory shape of lower porosity and enhanced high temperature strength is made from coarse refractory grain retained on a 100 mesh screen and prereacted magnesia-chrome grain passing a 100 mesh screen by incorporating from about 0.5% to about 15%, by weight of the total composition, finely divided alumina.

3,577,247

MAGNESIUM ALUMINATE SPINEL BONDED REFRACTORY

Bernard D. McKenna, San Jose, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,756
Int. Cl. C04b *35/44*
U.S. Cl. 106—62 **7 Claims**

A magnesium aluminate spinel bonded shape is made by admixing refractory grain retained on a 100 mesh screen with magnesium aluminate grain passing a 100 mesh screen and containing up to three moles of magnesia for each mole of alumina, and sufficient —100 mesh alumina to react with the —100 mesh magnesium aluminate grain to form a matrix containing not over 1.25 moles of magnesia for each mole of alumina, and firing the admixture after forming it into a shape.

3,577,248

LOW MOLECULAR WEIGHT LINEAR ALKYL BENZENE SULFONATE AS FROTHING AGENTS FOR GYPSUM BOARD MANUFACTURE

Robert B. Doan, Drexel Hill, and Robert C. Taylor, King of Prussia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Filed Nov. 6, 1967, Ser. No. 680,989
Int. Cl. C04b *11/00*
U.S. Cl. 106—111 **8 Claims**

This invention relates to gypsum boards and to a method for producing the board which utilizes as a frothing agent an alkyl benzene sulfonate having a linear secondary alkyl side chain with an average carbon content ranging from 8.5 to 10.5 and a maximum carbon number spread of 8 carbon atoms. Preferably, the average carbon content ranges from 9.5 to 10.5 and the carbon number spread is a maximum of 5 carbon atoms. This frothing agent is generally utilized in amounts ranging from 0.01 to 0.1 part per 100 parts by weight gypsum.

3,577,249

BITUMINOUS DISPERSIONS HAVING IMPROVED ADHESION AND PROCESS THEREOF

Jack N. Dybalski, Chicago, Ill., assignor to Armour Industrial Chemical Company, Chicago, Ill.

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,135
Int. Cl. C08h *13/00*; C08k *1/62*; C09d *3/24*
U.S. Cl. 106—269 **9 Claims**

Bituminous dispersion containing a bituminous phase in an amount from 20–90 wt. percent can be provided with unusually good adhesion by the addition of certain aryl-substituted aliphatic nitrogen compounds. These compounds are long chain mono-aralkyl or di-aralkyl amines, aralkyl diamines, and their oil-soluble salts.

3,577,250

METHOD OF RUBBERIZING ASPHALT

Fritz S. Rostler, Berkeley, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

No Drawing. Filed Mar. 20, 1968, Ser. No. 714,424
Int. Cl. C08h *13/00*; C08j *1/46*; C09d *3/24*
U.S. Cl. 106—278 **16 Claims**

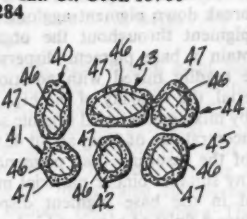
Method of incorporating an elastomer into asphalt by treating the asphalt pavement with an emulsion having an external water phase and an oil phase containing a dissolved elastomer, the oil preferably having an initial boiling point of not substantially less than 300° C. at 760 mm. Hg and a viscosity of above about 50 SUS at 210° F., the oil being mutually compatible with the asphalt and the elastomer.

3,577,251

MOLDING POWDER FOR PROJECTABLE TARGET

Vernon C. Moehlman, St. Louis, and Robert J. Klein, Florissant, Mo., assignors to Olin Corporation

Continuation of application Ser. No. 680,276, Sept. 14, 1967, which is a division of application Ser. No. 569,283, Aug. 1, 1966, which in turn is a continuation-in-part of application Ser. No. 338,031, Jan. 16, 1964. This application Feb. 26, 1969, Ser. No. 804,370
Int. Cl. C08h *13/00*
U.S. Cl. 106—284 **9 Claims**



A molding powder adapted to be briquetted to a coherent but brittle compact of the size and shape of a

frangible target of the projectable type. The molding powder comprises granules of limestone all of which are at least partially encapsulated by a coal tar pitch.

3,577,252
PROCESS OF PRODUCING ZIRCONIUM SILICATE CERAMIC COLORING SUBSTANCES
Wilhelm Brugger, Essen, Germany, assignor to Th. Goldschmidt A.G., Essen, Germany
No Drawing. Filed Sept. 11, 1968, Ser. No. 759,223
Claims priority, application Germany, Sept. 13, 1967, P 16 46 550.2
Int. Cl. C03c *5/02*; C09c *1/00*
U.S. Cl. 106—299 **8 Claims**

Process of producing ceramic coloring substances suitable as glaze stains. Metal oxide containing, color producing mixtures are calcined or sintered in the presence of 1–5% by weight, calculated on the amount of the mixture to be sintered, of a halogenated hydrocarbon having a boiling or sublimation point above 50° C.

3,577,253
TITANIUM DIOXIDE PIGMENT COMPOSITION
Warren M. Foss, Metuchen, N.J., assignor to National Lead Company, New York, N.Y.
No Drawing. Filed Aug. 28, 1968, Ser. No. 755,776
Int. Cl. C09c *1/36, 3/02*; C09d *5/02*
U.S. Cl. 106—300 **4 Claims**

This invention describes a new type of titanium dioxide pigment composition which is vastly superior to any of the prior art pigments when used in acrylic systems, such as thermosetting or thermoplastic acrylic automotive finishes and exterior acrylic latex paints. The new titanium dioxide pigment composition is finely divided TiO_2 pigment particles containing a calcined coating of

$$SiO_2\text{-}Al_2O_3\text{-}Na_2O$$

composition in which the ratio of SiO_2 to Al_2O_3 is 3–8 to 1 and the ratio of SiO_2 to Na_2O is 5–20 to 1. The amount of coating is from 5% to 12%. A method for the preparation of this pigment composition is also described. The $SiO_2\text{-}Al_2O_3\text{-}Na_2O$ composition is precipitated onto the surface of the pigment at pH 3.5–6.5 and after adjusting the pH to 7.0–8.5 the coated TiO_2 pigment is calcined at 700–825° C.

3,577,254
PIGMENT DISPERSIONS
Frederick E. Petke, Princeton, N.J., assignor to Cities Service Company
No Drawing. Filed Mar. 22, 1968, Ser. No. 715,151
Int. Cl. C09c *3/02*
U.S. Cl. 106—308 **17 Claims**

Highly concentrated, stable base pigment dispersions in organic solvents are prepared by adding pigment to an organic solvent in the presence of surfactant. The rate of pigment addition is adjusted so that proper wetting out of the pigment in the solvent occurs. Pigment addition is continued until a high shear mass is obtained. This mass is then subjected to agitation for a sufficient period of time to break down pigment agglomerates and to disperse the pigment throughout the organic solvent. In order to obtain a base pigment dispersion composition that can be readily mixed with additional solvent and binder material, the viscosity of the high shear mass may be reduced by mixing additional organic solvent therewith. Pigment concentrations of from about 45% to about 90% by weight of the resulting base pigment dispersions are obtained. Any suitable binder material may be thereafter incorporated in the base pigment dispersion composition to produce a finished pigment-binder dispersion composition of high gloss and excellent dispersion characteristics.

3,577,255
PIGMENT DISPERSIONS
Frederick E. Petke, Princeton, N.J., assignor to Cities Service Company
No Drawing. Continuation-in-part of application Ser. No. 715,151, Mar. 22, 1968. This application Nov. 29, 1968, Ser. No. 780,298
Int. Cl. C09c *3/02*
U.S. Cl. 106—308 **19 Claims**

Highly concentrated stable base pigment dispersions in organic solvents are prepared by adding pigment to an organic solvent or a blend of miscible organic solvents in the presence of surfactant. The rate of pigment addition is adjusted so that proper wetting out of the pigment in the solvent occurs. Pigment addition is continued until a high shear mass is obtained. This mass is then subjected to agitation for a sufficient period of time to break down pigment agglomerates and to disperse the pigment throughout the organic solvent. In order to obtain a base pigment dispersion composition that can be readily mixed with additional solvent and binder material, the viscosity of the high shear mass may be reduced by mixing additional organic solvent therewith. Pigment concentrations of from about 45% to about 90% by weight of the resulting base pigment dispersions are obtained. Any suitable binder material may thereafter be incorporated in the base pigment dispersion composition to produce a finished pigment-binder dispersion composition of high gloss and excellent dispersion characteristics. Great adaptability in determining the characteristics of the final coating composition can be achieved when the pigment is initially dispersed in a solvent blend rather than a single organic solvent. In addition, the desirable properties of the final composition are often enhanced by the use of such a solvent blend.

3,577,256
SCRATCH AND ABRASION RESISTANT COATINGS FOR GLASS
Charles L. Benford, Jr., and James E. Mielke, Toledo, Ohio, assignors to Owens-Illinois, Inc.
No Drawing. Continuation of application Ser. No. 480,130, Aug. 16, 1965. This application June 26, 1969, Ser. No. 841,677
Int. Cl. C03c *17/32*
U.S. Cl. 117—6 **6 Claims**

Freshly formed glass tubing is provided with a water soluble, scratch and abrasion resistant coating which may also be removed by volatilization at annealing temperatures. The coating is applied as an aqueous solution containing 0.5% to 2% of an acrylic solution resin, 0.75% to 1.5% polyoxyethylene glycol and 0.075% to 0.25% melamine-formaldehyde solution resin. The solution may also include 0.025% to 0.05% polyvinyl alcohol.

3,577,257
METHOD FOR FORMING DECORATIVE POLYURETHANE COATINGS
George J. Hutzler, Williamsville, and Carl L. Schwenk, Cheektowaga, N.Y., assignors to Textron Inc.
No Drawing. Filed Oct. 30, 1968, Ser. No. 771,988
Int. Cl. B44d *1/16*; B44c *1/06*
U.S. Cl. 117—26 **10 Claims**

There is disclosed a method for forming decorative polyurethane coatings and in the procedure a solid substrate is coated with a liquid polyurethane composition, for instance, of the moisture-curing type. While the thus applied polyurethane is still tacky, particulate pigment solids bearing a curing aid for polyurethanes are placed on the coating. The solids-bearing coating is then covered with a clear polyurethane which again may be of the moisture-curing variety, and the curing air which is an integral part of the pigment solids has a curing effect on both the underlying and overlying polyurethane coat-

ings. The pigmented solids thus exert a decorative or coloring effect through the overlying clear coating. The curing aid may be either of the catalytic or reactive type. Since the curing aid is included in the particulate solids which do not contact the polyurethane vehicles until they are in place on the supporting substrate, the vehicles as a result, have adequate working time, and construction jobs, for instance, wherein the vehicles are formed as a monolithic or seamless flooring can be planned and executed with facility. The particulate solids are frequently thin chips composed of finely divided pigment solids, binder and curing aid.

3,577,258

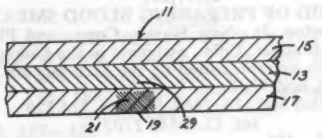
WRAPPING MATERIAL FOR MOISTURE-CONTAINING ARTICLE AND METHOD FOR MAKING THE SAME

Joseph T. Sincavage, Knowltonwood, Pa., Carl R. Pepmeier, Fredericksburg, Va., and Louis E. Stoffregen, Springfield, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 19, 1968, Ser. No. 714,281

Int. Cl. B44d *1/44;* **B32b** *23/08*

U.S. Cl. 117—62 **6 Claims**



A wrapping material for encasing moisture-containing products formed of a non-fibrous, hydrophilic regenerated cellulose sheet having on at least one side thereof a coating of moistureproof material, such as, nitro-cellulose, polyethylene, vinyl copolymers, vinylidene copolymers, with the coated side having a selected area of lower moistureproof properties than the remainder thereof whereby the portion of the regenerated cellulose sheet adjacent to such selected area of a coated side is more receptive to moisture and thus more frangible than the remainder thereof.

3,577,259

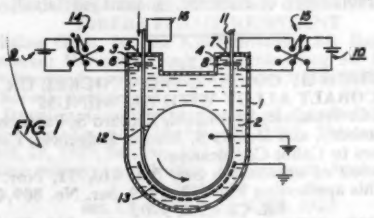
LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES UTILIZING A TONER-FREE ZONE

Masamichi Sato, Yasuo Tamai, and Seiji Matsumoto, Asaka-shi, and Goro Akashi, Odawara-shi, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 19, 1968, Ser. No. 760,956

Int. Cl. C03g *13/10, 15/10*

U.S. Cl. 117—37 **15 Claims**



Images are formed by providing a liquid developer bath comprising a continuous insulating liquid carrier phase and a discontinuous particulate toner phase, forming in the bath at least one zone substantially free of the toner phase, transporting an imaging member bearing an electrostatic latent image through the toner-free zone and thereafter passing the imaging member through the remainder of the bath. The imaging member may be transported through a substantially toner-free zone in the bath after development of the latent image to further improve image quality.

3,577,260

DECORATIVE ARTICLE AND METHOD OF MANUFACTURE THEREFOR

Roberta J. Hanna, 7555 Ashburn St., Houston, Tex. 77017

No Drawing. Filed Nov. 21, 1967, Ser. No. 685,247

Int. Cl. B44d *1/02;* **B44c** *5/06*

U.S. Cl. 117—68 **5 Claims**

A manufactured, decorative article and method preferably formed on a base material having the desired shape and serving as a source of pigmentation wherein a resin coating essentially dissolves the base member while maintaining its shape, and dries with the pigmentation fused therethrough to define a decorative body having a desired color and texture of surface.

3,577,261

SUBSTRATE WITH ADHERENT LAYER HAVING COLOR IMPARTED BY SAID SUBSTRATE

Kenneth K. Klar, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,778

Int. Cl. B32b *25/04, 27/20*

U.S. Cl. 117—80 **4 Claims**

A composite structure comprising a substrate and an adherent layer deposited thereon having a color imparted by the substrate prepared by the method which comprises (A) obtaining a substrate comprising a mixture of a rubbery polymer selected from the group consisting of natural rubber and synthetic rubber, at least one rubber processing oil and a dye soluble in the processing oil, (B) depositing a layer on the surface of the substrate comprising a mixture of a particulate pigment and a solvent for the said dye, the said layer colored by the pigment in contrast to the color of the dye and the color of the substrate, (C) dissolving a portion of the dye in the solvent contained in the deposited layer to effect a change in color of the layer, and (D) substantially drying the said layer.

3,577,262

POLYESTER-SILOXANE COATED PRODUCT

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,780

Int. Cl. B44d *1/50;* **B41m** *7/00*

U.S. Cl. 117—93.31 **8 Claims**

A radiation-curable, film-forming paint binder is prepared from an alpha-beta olefinically unsaturated polyester and an alpha-beta olefinically unsaturated siloxane formed by reacting a siloxane having at least two functional groups selected from hydroxyl groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta olefinically unsaturated carboxylic acid. The binder may also include vinyl monomers. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,263

EPOXY RESIN-SILOXANE COATED ARTICLE

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Nov. 18, 1968, Ser. No. 777,551
Int. Cl. B44d 1/50, 1/44
U.S. Cl. 117—93.31 8 Claims

A radiation-curable, film-forming paint binder is prepared from an alpha-beta olefinically unsaturated epoxy resin and an alpha-beta olefinically unsaturated siloxane having at least two functional groups selected from hydroxyl groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta olefinically unsaturated carboxylic acid. In a preferred embodiment, the binder solution also contains vinyl monomers. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,264

SILOXANE-UNSATURATED ESTER COATED PRODUCT

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,779
Int. Cl. B44d 1/50; B41m 7/00
U.S. Cl. 117—93.31 7 Claims

A radiation-curable, film-forming paint binder is prepared by creating a solution of vinyl monomers and an alpha-beta olefinically unsaturated siloxane formed by reacting a siloxane having at least two functional groups selected from hydroxy groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta unsaturated carboxylic acid, e.g. hydroxy acrylates, methacrylates, cinnamates and crotonates. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,265

VINYL RESIN-SILOXANE COATED ARTICLE

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,781
Int. Cl. B44d 1/50; B41m 7/00
U.S. Cl. 117—93.31 9 Claims

A radiation-curable, film-forming paint binder is prepared from an alpha-beta olefinically unsaturated vinyl monomer-comprising binder resin and an alpha-beta olefinically unsaturated siloxane having at least two functional groups selected from hydroxyl groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta olefinically unsaturated carboxylic acid. In a preferred embodiment, the binder solution also contains vinyl monomers. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,266

SUPERFICIALLY POROUS CHROMATOGRAPHIC PACKING WITH SULFONATED FLUORO-POLYMER COATING

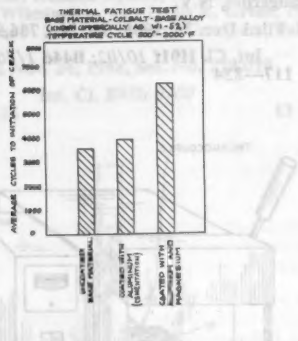
Joseph J. Kirkland, New Castle County, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 13, 1969, Ser. No. 790,724
Int. Cl. B44d 5/00
U.S. Cl. 117—100 8 Claims

A coating of a polymer of the compound

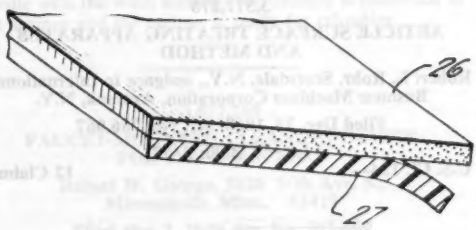
$$CF_2{=}CFOCF_2CFOCF_2CF_2SO_3H$$
$$\quad\quad\quad

selected alloy with a material consisting essentially of from about 10 to 30 weight percent magnesium with the balance being aluminum and then heating the so-treated


THERMAL FATIGUE TEST
BASE MATERIAL - COLBALT - BASE ALLOY
(KNOWN COMMERCIALLY AS WI-52)
TEMPERATURE CYCLE 600°-2000° F
AVERAGE CYCLES TO INITIATION OF CRACK
UNCOATED BASE MATERIAL
COATED WITH ALUMINUM (UNDOPED)
COATED WITH ALUMINUM AND PHOSPHORUS DOPED

alloy in a non-oxidizing atmosphere to a temperature above about 1800° F. to cause the aluminum-magnesium material to coat and diffuse into the treated surface of the iron, nickel or cobalt base alloy.

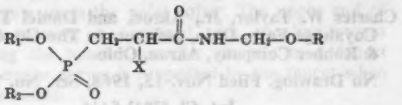
3,577,269
LOW TEMPERATURE TAR TAPE
William J. O'Brien, Hamden, Conn., and Raymond E. Downey, Copley, Ohio, assignors to Dart Industries Inc.
Filed Oct. 23, 1968, Ser. No. 769,996
Int. Cl. C09j *7/02, 7/04*
U.S. Cl. 117—122 **16 Claims**



A tape, and a process for manufacturing it, which can be used to protect pipe lines and which can be applied at temperatures as low as —20° F. and which has a backing layer and an adhesive layer containing an amorphous form of coal tar known as coal tar wax oil.

3,577,270
PROCESS FOR RENDERING CELLULOSIC FIBERS FLAME RESISTANT
Christian Guth, In den Klostermattern 28, Basel, Switzerland; Hermann Nachbur, Schlossweg 54, Dornach, Switzerland; and Arthur Maeder, Hochfeldweg 20, Therwil, Switzerland
No Drawing. Continuation-in-part of abandoned application Ser. No. 640,518, May 23, 1967. This application Oct. 29, 1969, Ser. No. 872,361
Claims priority, application Switzerland, June 1, 1966, 7,941/66
Int. Cl. C09d *5/18;* **C09k** *3/28*
U.S. Cl. 117—136 **7 Claims**

Cellulosic fibrous materials, especially textile materials, can be advantageously rendered flame resistant by applying to them an aqueous preparation of certain phosphorus compounds. The preparations have a pH-value below 3 and contain at least one compound of the formula



in which R represents a hydrogen atom, an alkyl radical or alkenyl radical, R_1 and R_2 each represents an alkyl, halogenalkyl or alkenyl radical containing up to 4 carbon atoms and X represents a hydrogen or halogen atom, a methyl group or a group of the formula

$$—CH_2—CO—NH—CH_2—O—R$$

where R has the above meaning.

The material so treated must then be dried, and subjected to a heat treatment at a temperature above 100° C. To achieve a flame-resistant finish fast to washing it is not necessary to add an aminoplast to the aqueous preparation as has been generally done heretofore. The present flame-resistant finish will withstand several washes or dry cleaning operations and the textile mechanical properties such as tear strength will be impaired but very little.

3,577,271
TEXTILE BOBBIN
Roger Bliven, Hopedale, Frank L. Allen, Jr., Hudson, and John R. Davis, Uxbridge, Mass., assignors to John Donald Marshall and Horace L. Bomar, Trustees of The Carolina Patent Development Trust
No Drawing. Continuation of application Ser. No. 607,626, Jan. 6, 1967. This application June 6, 1969, Ser. No. 858,552
Int. Cl. B44d *1/28*
U.S. Cl. 117—148 **1 Claim**

A wooden bobbin is disclosed having synthetic resins of the acrylic group impregnated entirely within the dimensions of the bobbin to provide a surface which shall be physically and chemically resistant to a variety of man-made yarns.

3,577,272
METHOD OF MAKING X-RAY SENSITIVE ELECTRORADIOGRAPHIC ELEMENTS
Raymond F. Reithel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,195
Int. Cl. B44d *1/18;* **G03c** *1/00*
U.S. Cl. 117—201 **10 Claims**

Electroradiographic elements containing, as a photoconductor, tetragonal lead monoxide prepared by heating orthorhombic lead monoxide in water and subjecting the material to a post heat treatment are sensitive to X-radiation and useful in electroradiography.

3,577,273
PRODUCING A TRANSPARENT COPPER COATING ON A SURFACE
Leif Erik Roland Soderberg, Lidingo, Sweden, assignor to Aga Aktiebolag, Lidingo, Sweden
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,174
Claims priority, application Sweden, Nov. 30, 1967, 16,456/67
Int. Cl. H05b *33/28*
U.S. Cl. 117—211 **7 Claims**

A copper coating having a permanent value of electrical resistance is provided on a non-metallic surface, specially a glass surface, by means of a treatment with a solution of SnF_2.

3,577,274

RESIN COATINGS CONTAINING ZINC INCLUSIONS

Charles W. Taylor, Jr., Akron, and Daniel T. Conrad, Cuyahoga Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Nov. 15, 1968, Ser. No. 776,267

Int. Cl. H01l *5/16*

U.S. Cl. 117—213 8 Claims

Corrosion resistance together with electrical insulation is provided for ferrous substrates by a solid resinous coating containing between 9 to 35 percent by weight (1.6 to 10 percent by volume) of pulverulent zinc in a heat fusible resin such as polyester. The coating may be applied by any suitable powder coating method, e.g. fluidized-bed. The application process and articles produced thereby are disclosed.

3,577,275

SEMI-CONDUCTOR CRYSTAL SUPPORTS

John C. Kosco, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

No Drawing. Continuation-in-part of application Ser. No. 569,575, Aug. 2, 1966. This application Apr. 2, 1969, Ser. No. 812,854

Int. Cl. C23c *13/08*

U.S. Cl. 117—213 5 Claims

Semi-conductor crystal supports comprising a base of the group consisting of tungsten and molybdenum are prepared by oxidizing at least the surface of the base to which a current lead is to be soldered, coating at least that surface of the base with a metal of the group consisting of silver and copper, and then subjecting the coated base to hydrogen or other reducing atmosphere at a temperature above the melting point of the coating metal. Preferably the density of the base is at least 93 percent of theoretical.

3,577,276

ELECTRICAL RESISTORS

James Edge, Morpeth, England, assignor to Welwyn Electric Limited, Bedlington, Northumberland, England

Original application Sept. 26, 1967, Ser. No. 670,687. Divided and this application Nov. 12, 1969, Ser. No. 871,279

Claims priority, application Great Britain, Sept. 27, 1966, 43,028/66

Int. Cl. C23b *5/62*

U.S. Cl. 117—213 2 Claims

Electrical precision resistors having a ceramic former are provided with a resistance film of a nickel-phosphorus alloy with an electrical surface resistance value between 0.5 ohm to 500 kilohms per square, the alloy containing from 5 to 16% by weight of phosphorus, the thickness of the film varying from 220 A. to 25,000 A. and the root-mean-square deviation of film thickness between different samples of area with a dimension greater than 0.01 x 0.01 cm. is at most 8% of the mean thickness at the lowest electrical resistance value and at most 4% at the highest electrical resistance value; the manufacture of these resistors is effected batch-wise by a method involving reactivating a catalytic palladium layer, before electrolessly depositing the nickel-phosphorus film while tumbling the resistors in the plating solution, by washing with a reactivating solution containing hypophosphite and nickel ions, and the deposited nickel-phosphorus film is stabilized by heating in air to a temperature of from 100 to 400° C.

3,577,277

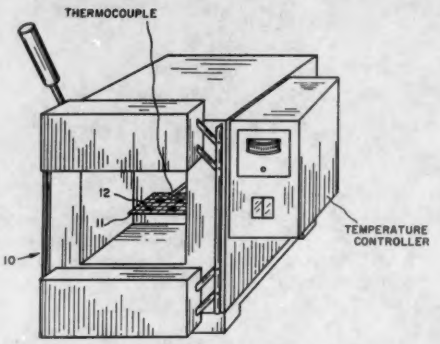
POLYMER COATINGS

Robert D. Fisher, Woodstock, and James A. Magee, Saugerties, N.Y., assignors to Ferroxcube Corporation, Inc., Saugerties, N.Y.

Filed Dec. 26, 1968, Ser. No. 786,998

Int. Cl. H01f *10/02;* B44d *1/46*

U.S. Cl. 117—234 2 Claims



A post treatment process of improving the characteristics of poly p-(xylylene) coated ferrite articles by heating the article to at or just above the melting point of the polymer and maintaining the temperature for a specified duration.

3,577,278

ARTICLE SURFACE TREATING APPARATUS AND METHOD

Robert L. Rohr, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1968, Ser. No. 786,067

Int. Cl. B08b *3/02*

U.S. Cl. 134—1 12 Claims

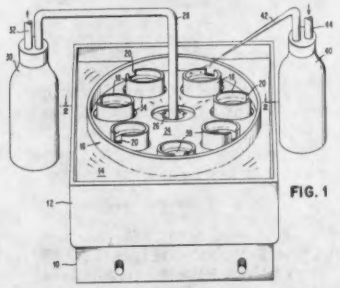


FIG. 1

An article surface treating apparatus is described herein in which an article holder having a plurality of articles mounted thereon is buoyantly disposed in a tank containing a fluid. The article holder is continuously caused to rotate by a stream of a liquid solution impinging thereon, so as to cause the successive surface treatment of the articles. The articles may be subjected to a process, e.g. (cleaning and rinsing or etching and rinsing) wherein several solutions may be programmed to serially treat the surfaces of the plurality of articles.

3,577,279

METHOD AND APPARATUS FOR AUTOMATICALLY CLEANING SYRINGES

Gene E. Lightner, Kennett Square, Pa., and Howard Blair Muhlestein, Wilmington, and Louis E. Green, Newark, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 26, 1968, Ser. No. 779,019

Int. Cl. B08b 9/00

U.S. Cl. 134—23 13 Claims

A sealed chamber is placed on the plunger end of an otherwise conventional syringe. The plunger is automatically moved axially through the sealed chamber. A wash solvent is introduced in the chamber such that as the plunger is withdrawn from the syringe, the plunger is cleaned by the solvent. Next a drying gas is introduced into the chamber to force the wash solvent down through the syringe, thereby cleaning the syringe and the syringe needle with the wash solvent. The plunger is reinserted in the syringe and the syringe is ready for reloading.

3,577,280

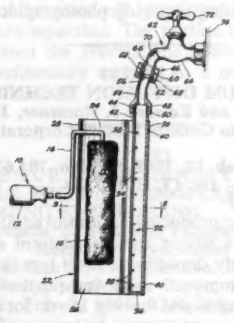
FAUCET-MOUNTED CLEANING DEVICE FOR PAINT ROLLERS

Robert W. George, 5620 26th Ave. S., Minneapolis, Minn. 55417

Filed Apr. 2, 1969, Ser. No. 812,694

Int. Cl. B08b 3/00

U.S. Cl. 134—138 3 Claims



A cylindrical casing has an open top and open bottom. A tubular member secured to the casing is provided with a series of vertically spaced apertures which spray water onto the paint roller when inserted through the open top, the water being free to drain through the open bottom after impinging upon the paint roller. The upper end of the tubular member is equipped with coupling means for attaching the tubular member directly to a faucet so that the entire device is supported by the faucet when cleaning the roller.

3,577,281

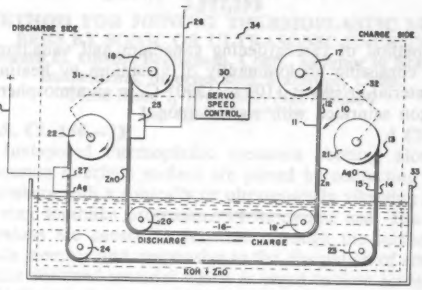
RECHARGEABLE MOVING TAPE CELL

Clifford Harold Pountney and Edward Francis Miller, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 28, 1969, Ser. No. 819,548

Int. Cl. H01m 35/00

U.S. Cl. 136—6 20 Claims



A rechargeable cell comprising, in a charged state, a bulk aqueous electrolyte of potassium hydroxide saturated with zinc oxide; a cathode; and an anode comprising a long steel tape coated with zinc on its active surface. The tape is driven from a storage reel through a region in the electrolyte adjacent to the cathode, and onto a takeup reel, at speeds dependent on the load current or voltage, or both. During charging, the tape is driven in the opposite direction. The cathode may be a stationary air permeable electrode; or it may comprise a tape similar to the anode and tape and similarly driven, coated with silver oxide on its active surface.

3,577,282

METHOD OF OXIDIZING TIN

Walter A. Schubert, South Elgin, Ill., assignor to Elgin Metal Casket Company, Elgin, Ill.

No Drawing. Filed Apr. 1, 1969, Ser. No. 812,331

Int. Cl. C23f 5/02, 7/00

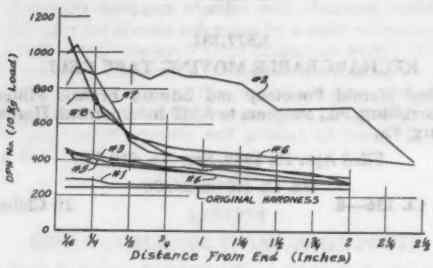
U.S. Cl. 148—6.24 9 Claims

A method of plating metallic articles with tin and of treating the tin plated articles to produce oxidation or the appearance of oxidation. The method includes an acid treatment of metallic articles which have been plated with tin by any suitable method of plating, by means of which the tin plate is altered to provide an appearance of oxidation and they may be mechanically treated thereafter to remove some of the material to produce an effect sometimes called "antiquing."

3,577,283
METHOD OF CASEHARDENING VANADIUM AND VANADIUM ALLOYS

John A. Zic, Oak Lawn, and George F. Hill, Chicago, Ill., and Ross M. Mayfield, deceased, late of Glen Ellyn, Ill., by Georgia P. Mayfield, sole heir, Glen Ellyn, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 7, 1969, Ser. No. 805,384
Int. Cl. C21d 1/74
U.S. Cl. 148—20.3 1 Claim



A method of casehardening vanadium and vanadium alloys consisting predominantly of vanadium by heating the material briefly at 1100 to 1300° C. in an atmosphere of argon saturated with water vapor.

3,577,284
ACTIVATED FLUX

Alvin Schneider, Edison, and Joseph Tarnowsky, Teaneck, N.J., assignors to Alpha Metals, Inc., Jersey City, N.J.

No Drawing. Filed Apr. 7, 1969, Ser. No. 822,821
Int. Cl. C23c 1/12
U.S. Cl. 148—23 28 Claims

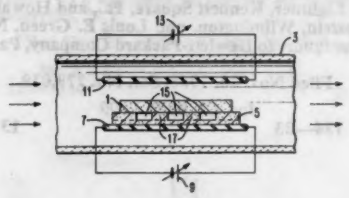
A flux for low melting point alloys composed of a fluxing agent and an activating agent of a phenacyl halide or a derivative thereof, which does not exceed safe limits for corrosion and electrical properties.

3,577,285
METHOD FOR EPITAXIALLY GROWING SILICON CARBIDE ONTO A CRYSTALLINE SUBSTRATE

Richard F. Rutz, Cold Spring, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1968, Ser. No. 716,928
Int. Cl. H01l 7/36; C01b 31/36; C23c 11/00
U.S. Cl. 148—175 9 Claims

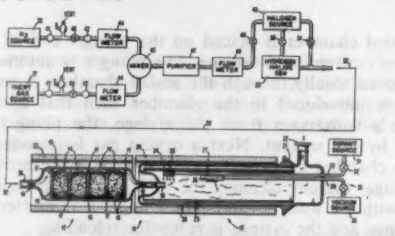
Epitaxial growth of semiconductive materials is effected in an inert atmosphere by physically contacting the surfaces of a source of semiconductive material to particular surface areas of a crystalline substrate onto which such growth is to be effected. The source is heated to a temperature to cause rapid vaporization of the semi-conductive material; the substrate is maintained at a slightly lower temperature to promote the condensation and epitaxial growth of the vaporized semiconductive material on the contacted substrate surfaces. The surface of the source can be preformed so as to grow particular patterns of the semiconductive material onto the substrate surface. Conductivity-type determining impurities can be introduced either into the inert atmosphere or be present in the source so as to impart a particular conductivity to the grown semiconductive material.



3,577,286
SEMICONDUCTOR PREPARATION AND DEPOSITION PROCESS

Melvin Berkenblit and Arnold Reisman, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1967, Ser. No. 674,471
Int. Cl. H01l 7/36, 7/00; C23c 11/00
U.S. Cl. 148—175 6 Claims



A process which includes the preparation of a substrate and subsequent epitaxial deposition of germanium on the substrate is described. Preparation of the substrate, either germanium or gallium arsenide, includes a chemical treatment step to remove surface films, rapid quenching, rinsing and drying steps, and a heating step prior to deposition. Deposition of germanium is carried out in an open tube disproportionation system, by introducing a germanium halide specie which is capable of disproportionating at a deposition site in concentrations and at velocities such that the deposition of germanium tends to be surface limited rather than mass transport limited. The deposition, preferably carried out on a (110) oriented substrate, is epitaxial, smooth and shiny and is suitable for subsequent processing requiring photographic techniques.

3,577,287
ALUMINUM DIFFUSION TECHNIQUE

John F. Norwich and Edward J. Roesener, Jr., Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1968, Ser. No. 704,676
Int. Cl. H01l 7/44
U.S. Cl. 148—189 5 Claims

A technique for producing an improved aluminum diffusion region in a silicon surface adjacent a surface region that is heavily doped with an N-type impurity such as phosphorus. Improved rectifying junctions sustaining higher back voltages and having lower forward voltage drop and lower reverse current leakage are produced by simultaneously exposing said silicon surface to a P-type impurity such as boorn, during the aluminum diffusion. A pretreatment of a diffusion furnace tube with boron and aluminum is also described.

3,577,288

BOEHMITE-COATED ALUMINUM TEXTILE PIRN

Walter G. Zelley and Charles J. Walton, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,744
Int. Cl. C23f 7/06; B65h 75/18
U.S. Cl. 148—6.27 11 Claims

A tubular aluminum textile pirn having an alpha-alumina hydrate coating thereon.

3,577,289

COMPOSITE HIGH ENERGY SOLID ROCKET PROPELLANTS AND PROCESS FOR SAME

Jacque C. Morrell, 8 Oxford St., Chevy Chase, Md. 20015

No Drawing. Continuation-in-part of application Ser. No. 404,896, Oct. 19, 1964. This application Feb. 12, 1968, Ser. No. 706,749
Int. Cl. C06d 5/06
U.S. Cl. 149—19 6 Claims

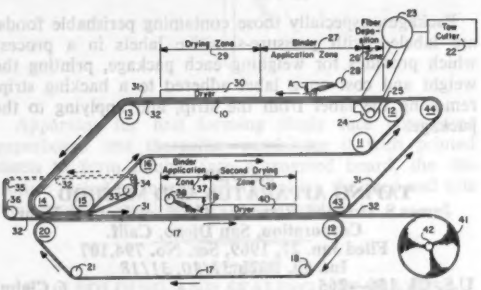
The invention relates to high energy solid rocket propellants comprising an elastomeric organic fuel bindner, a finely divided solid inorganic oxidizing agent, and an additive mixture of finely divided solid combustible high energy substances, one substance more readily ignitable than the other.

3,577,290

PROCESS OF MAKING A NONWOVEN FABRIC

Ralph J. Baskerville, Jr., and Joseph S. Baker, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 19, 1968, Ser. No. 753,352
Int. Cl. B31d 1/00
U.S. Cl. 156—62.2 6 Claims



A process of making a nonwoven fabric in which the newly completed nonwoven fabric is recycled and used as a moving support for new fabric web being formed until the latter becomes self-supporting. Then, the superposed webs are separated. The portion that was recycled is removed from the process; the newly completed web portion is continuously recycled as a moving support in the aforesaid manner.

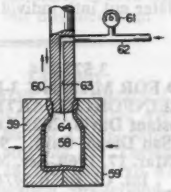
3,577,291

PROCESS FOR CONTINUOUSLY MOLDING BOTTLE FROM THERMOPLASTIC RESIN, CHARGING AND SEALING

Masaaki Uchida, 5, 4-chome, Fukagawa Takahashi, Koto-ku, Tokyo, Japan

Filed Jan. 23, 1969, Ser. No. 793,315
Claims priority, application Japan, Feb. 1, 1968, 43/5,711; Feb. 3, 1968, 43/6,273; Feb. 8, 1968, 43/7,450
Int. Cl. B29c 17/07; B65b 7/16
U.S. Cl. 156—64 5 Claims

A hollow plastic tube is molded of thermoplastic resin. The tube is transferred to a split metal mold and molded therein into the form of a bottle or container. The bottle or container, while still within the split metal mold, is checked for pinholes and/or other crack defects by feeding compressed air into the bottle. Those bottles or containers found to be non-defective are selected, charged, sealed and packaged.



3,577,292

METHOD FOR JOINING THERMOPLASTIC MEMBERS BY SONIC OR ULTRASONIC ENERGY

Edward G. Obeda, Brookfield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.

Filed Mar. 7, 1969, Ser. No. 805,206
Int. Cl. B29c 27/08
U.S. Cl. 156—73 4 Claims

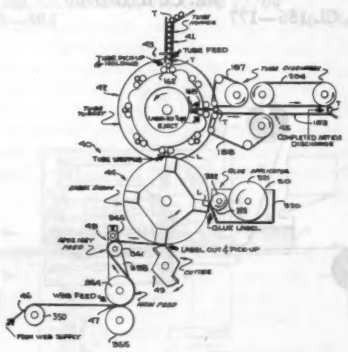
Juxtaposed thermoplastic members abutting along a common interface surface are joined by contacting both members with a sonically or ultrasonically vibrating horn having toothlike protrusions at its output end. The protrusions are caused to penetrate through the surface of each member and, responsive to the dissipation of energy, cause softened material which is urged to flow across the interface surface to provide, upon hardening, a joint.

3,577,293

METHOD OF LABELLING CYLINDRICAL OBJECTS

Eric K. Ritterhoff, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

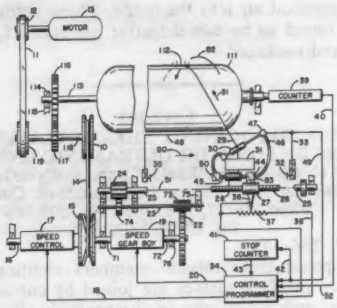
Original application Sept. 19, 1962, Ser. No. 224,660, now Patent No. 3,404,059, dated Oct. 1, 1968. Divided and this application Aug. 9, 1968, Ser. No. 751,439
Int. Cl. B32b 31/20; B65c 3/12
U.S. Cl. 156—156 4 Claims



This disclosure relates to a metnod of labelling cylindrical objects wherein the objects are primarily in the form of tubes which are flexible. The label is supplied in web form and initially a correct length of the web

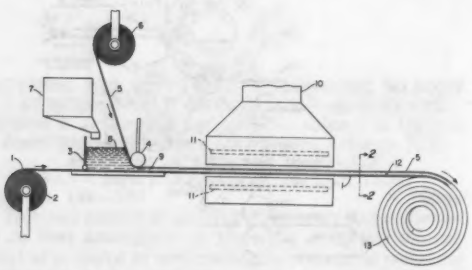
is cut off and carried by a drum past an adhesive applicator after which the section of the web is applied to a tube. The tube is carried by a turret and is pressurized at the time the web is being applied thereto. The tube is rotated during the application of the label with the two being rotated at the same speed as the labels being fed. The labelled tube is later cut into individual sections.

3,577,294
METHOD FOR MAKING 3-D FILAMENT REINFORCED ARTICLES
Constant David, 2625 Loring St., San Diego, Calif. 92109
Filed Mar. 17, 1969, Ser. No. 815,515
Int. Cl. B65h *54/06*
U.S. Cl. 156—173 **10 Claims**



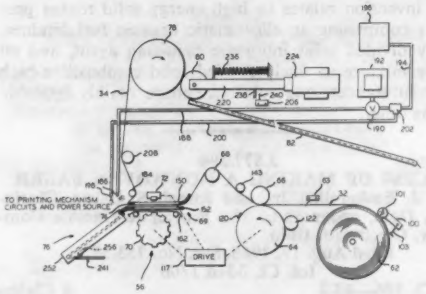
Method and apparatus for making 3-D filament reinforced shells by securing short reinforcing fibers onto a form which fibers project in a substantially normal direction from the surface of the form, and winding in helical arrangement strands coated with plastic resin onto the form either as individual strands or as tapes formed by a plurality of strands, which strands are substantially normal to the fibers.

3,577,295
METHOD OF BONDING TEXTILE FABRIC BELTS
Louis Seelbach Kraft, Stow, and Charles W. Quiner, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 10, 1968, Ser. No. 720,099
Int. Cl. B32b *5/00*
U.S. Cl. 156—177 **10 Claims**



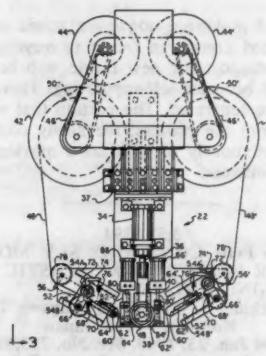
A method of preparing a composite structure comprising at least two support layers adhered to at least one layer of a cured polyurethane interposed therebetween which comprises controllably and continuously feeding support layers through a first station having a rear retaining means, a forward control means, and a reservoir of a liquid polyurethane mixture therein, and curing the polyurethane reaction mixture layer thereby superposed between the said layers to form the said composite structure.

3,577,296
METHOD FOR PRINTING AND APPLYING LABELS
Duane Phillips, Oxford, Roger C. Schultz, Pardeeville, and Herbert H. Beck, Portage, Wis., assignors to Armour and Company, Chicago, Ill.
Original application July 23, 1965, Ser. No. 474,441, now Patent No. 3,461,984, dated Aug. 19, 1969. Divided and this application June 18, 1969, Ser. No. 834,437
Int. Cl. B32b *31/00*
U.S. Cl. 156—249 **7 Claims**



Packages, especially those containing perishable foods, are labeled with pressure-sensitive labels in a process which provides for weighing each package, printing the weight and cost on a label adhered to a backing strip, removing the label from the strip, and applying to the package.

3,577,297
TAPING APPARATUS AND METHOD
James S. Howard, Riverside, Calif., assignor to Rohr Corporation, San Diego, Calif.
Filed Jan. 27, 1969, Ser. No. 794,107
Int. Cl. B32b *31/10, 31/18*
U.S. Cl. 156—265 **6 Claims**



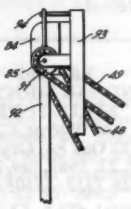
Apparatus for, and method of, laying strips of tape on a surface in adjacently disposed relation from two sides thereof, by means of the arrangement of two tape feeding and two tape cutting mechanisms on opposite sides of a

pressure roller carried by a support head which is adapted to move in opposite directions along parallel paths on said surface.

3,577,298
METHOD OF MAKING A BUILDING PANEL
Scilla de Glauco, 3921 Vasconia St. 33609, and Claudio Poccia, 4746 W. Anita Blvd. 33611, both of Tampa, Fla.
No Drawing. Filed June 5, 1969, Ser. No. 832,553
Int. Cl. B44c *1/06*
U.S. Cl. 156—239 **14 Claims**

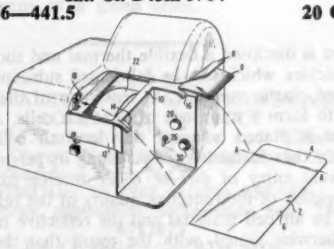
Compositions for building materials such as partitions, walls, etc., which are readily prepared and have all of the architectural requirements for prefabricated building materials. They consist of fiber glass, PVC expansion panels, unsaturable polyester resin, comminuted amethyst rock and, optionally, aerated calcium carbonate, besides the usual accelerators, diluents and catalysts.

3,577,299
REGISTER AND CONTROL APPARATUS FOR CORRUGATOR
Charles H. Klein and James K. Haley, Cincinnati, Ohio, assignors to Novelart Manufacturing Company, Cincinnati, Ohio
Filed Dec. 26, 1968, Ser. No. 787,105
Int. Cl. B32b *31/00*; B65h *25/00*
U.S. Cl. 156—361 **5 Claims**



Apparatus for first forming single face corrugated paperboard and thereafter combining it with printed sheets to form double face corrugated board, the disclosure including means for controlling the feed and side register of the constituent webs and sheets.

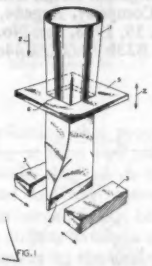
3,577,300
BAG FOLDING AND SEALING APPARATUS
John W. Glaze, Jr., and Joseph P. Worth, Charlotte, N.C., assignors to Intech Corporation, Charlotte, N.C.
Continuation-in-part of application Ser. No. 604,016, Dec. 22, 1966. This application Dec. 1, 1969, Ser. No. 881,175
Int. Cl. B43m *5/04*
U.S. Cl. 156—441.5 **20 Claims**



A shaft driven by a single revolution clutch operates (a) a mechanism for folding a closure flap against the body of a bag, (b) a mechanism for heat sealing the flap to the bag, and (c) a conveying mechanism for ejecting the sealed bag from the apparatus. A movable stop actuated by the shaft serves as a guide for properly locating a bag in the apparatus, and the stop is retracted after a flap is folded to permit ejection of the bag by the conveying mechanism.

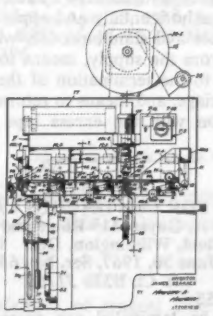
The flap folding mechanism includes a pivoted flap folding plate which has spaced apart openings permitting access of a series of similarly spaced apart heat sealing elements to a folded but unsealed flap.

3,577,301
APPARATUS FOR THE PRODUCTION OF TETRAHEDRAL HOLLOW ARTICLES
Ake Gustafson, Le Chatelet, Chatel-Saint-Denis, Switzerland, assignor to Tetra Pak AG, Zurich, Switzerland
Filed Sept. 28, 1967, Ser. No. 671,397
Claims priority, application Switzerland, Sept. 28, 1966, 13,999/66, 14,000/66
Int. Cl. B32b *31/02*
U.S. Cl. 156—461 **5 Claims**



Tetrahedral hollow articles are produced by forming a tube from a travelling web and passing the tube through a rigid guide means contacting the tube in at least two diametrically opposite regions so as to displace the position of undesirable kinks in the articles formed. Subsequently spaced apart transverse seams are provided across the tube. The guide means may be a plate having a square opening and a flexible sleeve of inelastic material is secured in the square opening. The total internal peripheral length of the opening is substantially equal to the circumference of the tube passing through the opening.

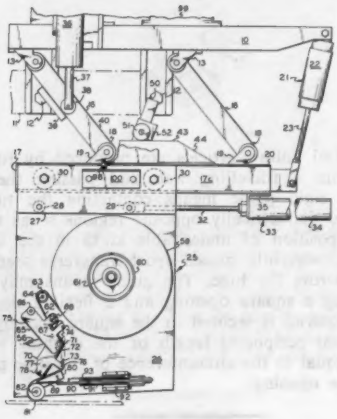
3,577,302
AUTOMATIC FILM SPLICING MACHINE
James Szakacs, 150 Pueblo Road, New Britain, Pa. 18901
Filed May 8, 1968, Ser. No. 727,414
Int. Cl. B65h *21/00*; G03d *15/04*
U.S. Cl. 156—504 **20 Claims**



A machine for automatically splicing together lengths of exposed photographic roll film to form a continuous film strip suitable for processing through high speed automatic film processing, printing or other film handling

equipment. The machine includes means for determining the length of a roll of film and for accurately cutting the film in proper registration with the film sprocket holes to remove the spool and paper backer. The machine automatically advances the lead edge of a film into abutting relation with the trailing edge of the preceding film in a splicing station, with the respective film sprocket holes in the proper registration. A strip of heat sealing splicing tape is then automatically inserted beneath the abutting film edges and a heat sealing ram is actuated for a predetermined time to complete the splice. The spliced film is then automatically wound onto a storage reel, the trailing edge of the film strip being stopped in the splicing station for attachment of the succeeding film length.

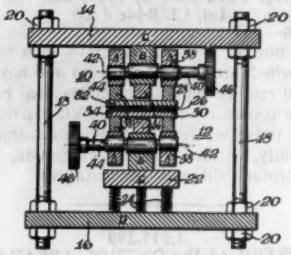
3,577,303
TAPE APPLYING APPARATUS
Erville C. Buck, Springfield, Oreg., assignor to Willamette Valley Company, Eugene, Oreg.
Filed Nov. 18, 1968, Ser. No. 776,525
Int. Cl. B23b *31/18*; B44c *7/02*
U.S. Cl. 156—522 **11 Claims**



An apparatus for applying a pressure-sensitive adhesive tape to a surface having a carriage means to support a supply of pressure-sensitive adhesive tape above the surface with a length of the tape hanging down, means to lower the carriage to a point at which the length of tape contacts the surface and adheres thereto, means to advance the carriage horizontally and apply a length of the tape to the surface and simultaneously withdraw a slight excess of tape from the supply, means to sever the tape at a point prior to the termination of the horizontal advance of the carriage, and means to return the carriage to its initial position with the excess tape hanging therebeneath.

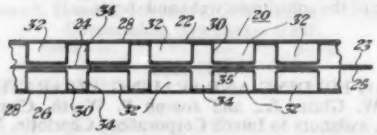
3,577,304
APPARATUS FOR CONTINUOUS LAMINATION
Hubert A. Guyer, 119 Ridgeland Road, Lynnfield, Wilmington, Del. 19803
Filed June 30, 1967, Ser. No. 650,368
Int. Cl. B32b *31/00*
U.S. Cl. 156—555 **13 Claims**

Materials to be laminated are passed between two continuous opposed bodies, as, for example, opposed pressure elements on the backside of two continuous belts which operate in alternation to apply pressure with or without heat, to the belts and hence to the laminate. The pressure elements also move the belt. One of the pressure elements is spring loaded and floating so as to maintain constant pressure at all times on the portion of the belts



and the material being laminated while said portion is in the laminating process.

3,577,305
THERMAL AND AIR SHOCK INSULATING STRUCTURE
Theodore G. Hines and Wayne C. Engle, both % Pine Instrument Co., 322 Oak St., Grove City, Pa. 16127
Filed Aug. 22, 1968, Ser. No. 754,534
Int. Cl. B32b *3/12, 15/08*; A41d *31/00*
U.S. Cl. 161—4 **10 Claims**

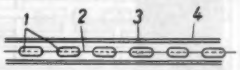


There is disclosed a flexible thermal and shock insulating structure which can be fabricated substantially from layers of plastic material. At least two of the layers are sealed to form a multitude of dead air cells. A reflective member is placed adjacent the dead air cells, and the assembly thus formed is sealed along its peripheral edges to prevent entry of dirt or other foreign material and deterioration of the reflective quality of the reflective surface. The air cell material and the reflective member are not otherwise joined, with the result that the assembly retains sufficient flexibity for use in manufacturing articles of clothing or the like. The assembly is further arranged to present a relatively smooth outer surface for protection of the sealed air cells and to enhance the qualities of the assembly for use as clothing or as other insulated articles subject to relatively rough handling and usage.

3,577,306
POLYMER LAMINATE TO PREVENT SEVERE METAL PETALLING DAMAGE
Ronald E. Baker, Maricopa, Richard L. Cook, Flagstaff, and Edwin C. Slagel, Maricopa, Ariz., assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Dec. 30, 1968, Ser. No. 787,716
Int. Cl. B64b *1/14;* D03d *11/00*
U.S. Cl. 161—90 6 Claims

A dual layer composite laminate consisting of at least one layer of high strength nylon cloth saturated with a polyurethane and cured to be made semi-flexible with a urethane elastomer pad bonded to one surface of the layer. The other surface of the pad is positioned adjacent the internal surface of metal aircraft skins or other metal structural members to prevent the inward protrusion of the material around a projectile hole through the skin or member so as to prevent petalling of the metal skin into the wound upon the passage of the projectile therethrough.

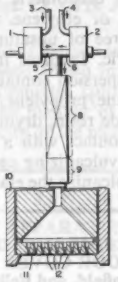
3,577,307
LEAD STRIP FOR WEIGHING DOWN CURTAINS
Franz Baier, Teichstrasse 3, Saerback, Germany, and Rudolf Schmitz, Austum 43, Emsdetten, Germany
Filed Sept. 19, 1966, Ser. No. 580,326
Claims priority, application Germany, Oct. 15, 1965, P 12 97 304.5
Int. Cl. A47h *1/00*
U.S. Cl. 161—175 3 Claims



A lead strip to be secured to the lower edge of a curtain or drape as weight means in which the individual lead members are surrounded by a relatively thin, hose-like sleeve made from polyterephthalate foil strip which is formed into a tube upon insertion of the lead member, by means of a glued seam.

3,577,308
MANUFACTURE OF A MULTICOMPONENT POLYMERIC PRODUCT
Korstiaan J. Marinus van Drunen and Wilhelmus J. Fontijn, Dieren, Netherlands, assignors to American Enka Corporation, Enka, N.C.
Filed Aug. 28, 1968, Ser. No. 755,903
Claims priority, application Netherlands, Sept. 27, 1967, 6712079
Int. Cl. D02g *3/00;* B29f *3/10*
U.S. Cl. 161—176 17 Claims

A process for the manufacture of a synthetic polymeric product consisting of a basic mass having a large number of endless threads embedded therein, which includes the steps of placing at least two polymeric components (e.g., a polyamide and a polyester), while in the liquid state, side by side to form a single main stream, repeatedly dividing and multiplying the main stream to form a stream having a first multi-layer structure, superimposing at least a second multi-layer structure onto the first, with the layers of the second being at an angle to the first multi-layer structure and thereafter extruding the resulting stream through a die.



Apparatus for effecting this process includes a feed means for supplying at least two polymeric components side by side to a main channel. A first mixer is located in the main channel and has stationary guiding means by which the main stream may be repeatedly divided and doubled into a stream having a multi-layer structure. A second mixer similar to the first is positioned downstream thereof and is turned on its longitudinal axis through an angle of at least 10° so that the resulting stream has a second layered structure that is at an angle to the first layered structure formed in the first mixer. A die means is used for extruding the resulting stream.

ERRATUM

For Class 161—189 see:
Patent No. 3,577,314

3,577,309
METALLIC CONDUCTOR WITH CERAMIC FIBER INSULATION
Wesley W. Pendleton and George W. Ostrander, Muskegon, Mich., assignors to Anaconda Wire and Cable Company
Original application Nov. 2, 1964, Ser. No. 408,125, now Patent No. 3,464,836, dated Sept. 2, 1969. Divided and this application Apr. 23, 1969, Ser. No. 835,845
Int. Cl. B32b *15/14, 17/02;* H01b *3/08*
U.S. Cl. 161—196 4 Claims

In the manufacture of magnet wire with glass-fiber insulation the fibers are drawn from a crystallizable composition which is subsequently heat-treated to form ceramic fibers in situ, said ceramic fibers having at least fifteen weight percent B_2O and at least fifty weight percent of crystals of either spodumene, jadeite, or benitoite.

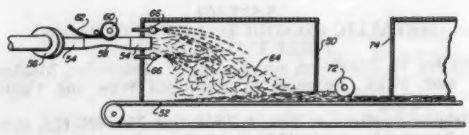
3,577,310
METHOD OF BONDING OLEFIN ELASTOMER TO TEXTILE FIBER AND PRODUCT OBTAINED
Luigi Torti and Guido Bertelli, Ferrara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy
No Drawing. Filed Oct. 10, 1967, Ser. No. 674,132
Claims priority, application Italy, Oct. 14, 1966, 28,859/66
Int. Cl. B32b *27/06*
U.S. Cl. 161—227 11 Claims

Process for bonding elastomeric saturated ethylene/alpha-olefin copolymer or ethylene/alpha-olefin/polyene terpolymer of low degree of unsaturation to natural or synthetic fibers or fabric. Involves treating the fibers or fabric with aqueous dispersion containing halogenated or chlorosulfonated ethylene/propylene/polyene terpolymer and phenol-formaldehyde resin; drying the treated fabric; placing the fabric in contact with a composition of the elastomer containing a vulcanizing agent; and heating the assembled product to vulcanize the elastomer.

3,577,311
FLOOR COVER
Richard W. Reiter, Plainfield, and Felix P. Liberti, Totowa Borough, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.
No Drawing. Filed Aug. 4, 1969, Ser. No. 847,418
Int. Cl. B32b *27/04, 27/08, 27/12;* C08f *37/00, 45/04*
U.S. Cl. 161—254 4 Claims

A flooring sheet including a felt backing layer and an upper surface plastisol layer bonded together with at least one tie-coat binder obtained from compositions which are based on selected copolymers, said copolymers containing moieties derived from vinyl acetate and at least one vinyl ester of an alpha-branched saturated aliphatic monocarboxylic acid.

3,577,312
FELTED FIBROUS WEB OR BATT
Otis R. Videen, St. Paul, and Donald E. Wiegand, Minneapolis, Minn., assignors to Conwed Corporation, St. Paul, Minn.
Filed Feb. 21, 1968, Ser. No. 707,147
Int. Cl. D21h *5/12*
U.S. Cl. 162—148 10 Claims



A felted fibrous web or batt having enhanced resiliency is produced with from 10% to 100% short fibers of chemically pulped wood. A resin binder is used which includes a cellulose reactive crosslinking reagent.

3,577,313
CONDENSATION PRODUCTS OF AMINES WITH EPIHALOHYDRINS
Justin C. Bolger, Needham, Hugh Evan McCollum, Cambridge, and Robert William Hausslein, Lexington, Mass., assignors to Amicon Corporation, Lexington, Mass.
No Drawing. Filed Oct. 16, 1967, Ser. No. 675,354
Int. Cl. D21d *3/00;* D21h *3/36*
U.S. Cl. 162—164 7 Claims

A condensation product, with an epihalohydrin, of a polyalkylene polyamine having the composition

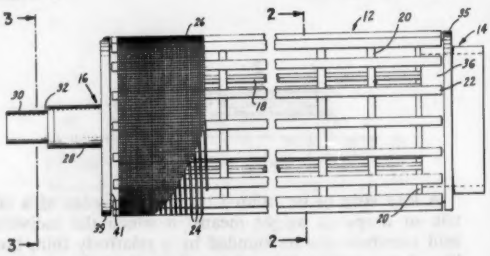
$$NH_2—(A—NH)_n—H$$

in which A represents a straight chain alkylene group having 4 to 8 carbon atoms and n is a number from 2 to 6, and a second amino compound selected from the class consisting of ammonia; hydrazine; and the polyethylene polyamines, polypropylene polyamines, alkanolamines, and ethylamine alkanolamines having at least two hydrogen atoms attached to amino nitrogen, having a miscibility with water of at least 20% by weight of amino compound, and having a pK_a at 25° C. of at least about 9.0.

3,577,314
LAMINATED FUEL CELL CONTAINER
Theodore A. Evans, Akron, Ohio, asignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Mar. 24, 1969, Ser. No. 810,019
Int. Cl. B65g *3/00*
U.S. Cl. 161—189 5 Claims

This invention relates to a method of preparing a container by forming a laminate comprising a polyamide fabric having a coating of a fluorocarbon composition thereon and having a polyamide film adhered to the fluorocarbon coating, the fluorocarbon composition being cured with an organic peroxy compound, an organic amine or a Schiff's base when compounded with metal oxides and iron oxide.

3,577,315
FORAMINOUS FORMING ROLLS FOR A PAPERMAKING MACHINE PRODUCED FROM SYNTHETIC RESINS
George H. Franklin, 734 Bliss Road, Longmeadow, Mass. 01106
Continuation-in-part of application Ser. No. 610,280, Jan. 19, 1967. This application Aug. 28, 1968, Ser. No. 767,023
Int. Cl. D21f *1/60, 3/10*
U.S. Cl. 162—210 27 Claims



Forming rolls, such as the dandy rolls and the cylinder molds employed in the papermaking art, are fabricated from synthetic resins to reduce their weight and cost while increasing the corrosion resistance and ease of fabrication thereof to provide highly porous structures facilitating water passage. The structure of the invention comprises a hollow cylindrical foraminous body portion with head members at each end thereof to provide for mounting. The body portion is comprised of circumferentially extending support means spaced along the length thereof and a multiplicity of axially extending stiffening rods and top rods arranged about the circumference thereof, the support means in part lying radially outwardly of the stiffening rods, and the top rods lying radially outwardly of the support means. The winding wire and screen are supported upon the top rods, and may be synthetic resin if so desired.

3,577,316

REPLACEABLE DEFLECTOR BLADE STRUCTURE FOR A PAPERMAKING MACHINE

Andre G. Piette, Tracy, Quebec, Canada, assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 6, 1969, Ser. No. 789,130

Int. Cl. D21f *7/00*

U.S. Cl. 162—352 5 Claims

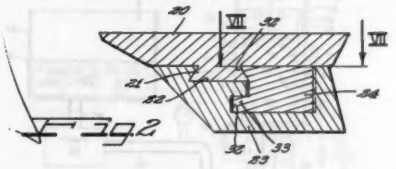


Fig. 2

Arrangement for releasing a foil or deflector blade associated with a traveling Fourdrinier wire to enable the blade to be quickly replaced. The deflector blade, which constitutes a de-watering element, has a dovetail by which it is held on a rail by a dovetail recess formed by the rail and a slide positioned in the rail. Longitudinal position of the slide in the rail determines whether the dovetail recess is narrowed to grip the dovetail of the deflector blade and thereby hold it on the rail or is widened to release the dovetail and thereby permit easy removal of the blade from the rail.

3,577,317

CONTROLLED FUSION REACTOR

Cornelius H. Woods, Livermore, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed May 1, 1969, Ser. No. 820,750

Int. Cl. G21b *1/00*

U.S. Cl. 176—4 8 Claims

Controlled fusion reactor of the Astron type having a magnetic containment zone created by the interaction of the magnetic field of a high energy cylindrical layer of charged particles rotating in an axially symmetric magnetic field region in which an additional axial conductor introduces a shear magnetic field component to suppress instabilities which cause plasma loss.

3,577,318

PROCESS FOR MAKING 6-HYDROXY-3-KETO Δ^4-STEROIDS OF THE PREGNANE AND ANDROSTANE SERIES

Klaus Kieslich, Berlin, and Wolfgang Koch, Darmstadt-Arheilgen, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

No Drawing. Filed Jan. 28, 1970, Ser. No. 12,877

Claims priority, application Germany, Jan. 27, 1969, P 19 04 543.3

Int. Cl. C07c *167/14*

U.S. Cl. 195—51 3 Claims

6-hydroxy-3-keto-Δ^4-steroids of the pregnane or androstane series are made by fermenting a 3β-hydroxy or 3β-acyloxy-5,6-epoxy steroid of the pregnane or androstane series which is saturated in the A-ring with bacteria of the genus Flavobacterium of Pseudomonas, or enzymes thereof.

3,577,319

LARGE SCALE CULTIVATION OF *BORDETELLA PERTUSSIS* CELLS FOR VACCINE PRODUCTION

Peter Adams Nielsen, Ridgewood, Murray Sam Cooper, Dumont, and Ernest Robert Doyno, Woodcliff Lake, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 27, 1968, Ser. No. 732,063

Int. Cl. C12k *3/00*

U.S. Cl. 195—96 6 Claims

A *Bordetella pertussis* vaccine is prepared by deep tank cultivation using a seed grown in a biphasic culture system. The process eliminates cultivation on a blood-free seed agar, reduces the number of containers, and results in increased antigenicity of the phase I *Bordetella pertussis* vaccine.

3,577,320

DISTILLATION APPARATUS WITH VACUUM CONTROLLED BY RATE OF DISTILLATE FLOW

Forrest Thompson Randell, Glasgow, Scotland, assignor to G. & J. Weir Limited, Cathcart, Glasgow, Scotland

Filed Nov. 6, 1968, Ser. No. 773,885

Claims priority, application Great Britain, Nov. 24, 1967, 53,475/67

Int. Cl. B01d *3/42*

U.S. Cl. 202—160 4 Claims

Distillation apparatus comprises a vessel having an evaporation section including a heating coil for the liquid to be distilled; and a condensing section including a vapour cooling coil; a heating medium supply to the heating coil; a pump or air ejector for creating a vacuum within the vessel; and a distillate outlet conduit from the condensing section. There are provided a sensor for sensing the rate of distillation of liquid, and a valve to regulate the vacuum within the vessel, the valve being operable by the sensor to regulate said vacuum in accordance with the rate of distillation whereby the rate of evaporation and consequently distillation are maintained at a desired value.

3,577,321

COMBINED COKE OVEN DOOR JAMB CLEANING APPARATUS AND DOOR HANDLING APPARATUS

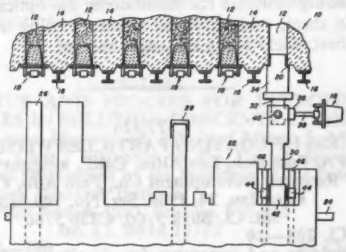
Paul Schaten, Recklinghausen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 4, 1969, Ser. No. 804,143

Claims priority, application Germany, Mar. 7, 1968, P 16 71 333.0

Int. Cl. C10b *25/14, 33/08, 37/07*

U.S. Cl. 202—241 4 Claims



A coke oven pusher machine has a supporting arm extending therefrom and movable longitudinally toward and

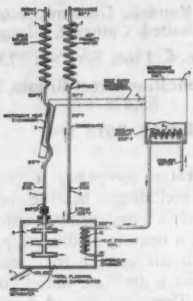
away from the coke oven chamber. A connecting member is pivotally secured to the end of the supporting arm and has door jamb cleaning apparatus and door handling apparatus secured thereto in angular spaced relation to each other. A suitable drive means is provided to pivot the connecting member relative to the end of the supporting arm to position either the door jamb cleaning apparatus or the door handling apparatus in operative position with the coke oven door jamb. With this arrangement, the coke oven door jamb can be cleaned and the coke oven door replaced without moving the pusher machine.

3,577,322

MICROWAVE HEATING IN THE DESALINATION OF WATER

Stephen J. Nesbitt, 1111 Massachusetts Ave., Washington, D.C. 20005, and Edward M. Knapp, 951 N. Livingston St., Arlington, Va. 22205

Filed Dec. 3, 1968, Ser. No. 780,659
Int. Cl. B01d *1/18, 1/02, 3/08*
U.S. Cl. 203—11 **1 Claim**



A system for the single stage flash distillation of saline or polluted water, combining the use of microwave output power as well as the waste heat in the microwave coolant as a source of heat and including centrifugal separation of particulate matter separated from the solute system by the change of state.

3,577,323

HIGH QUALITY SUBMASTERS

Marlowe A. Pichel, Altadena, Calif., assignor to Xerox Corporation

Original application Apr. 13, 1964, Ser. No. 359,280, now Patent No. 3,428,533, dated Feb. 18, 1969. Divided and this application Dec. 30, 1968, Ser. No. 806,765 (Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. C23b *7/06*
U.S. Cl. 204—7 **2 Claims**

This application relates to a replica metal master having a thin sheet of metal electroformed in a desired shape and a rigidizing structure for maintaining the optical accuracy of said sheet, said rigidizing structure being mounted on said sheet solely along the edges thereof.

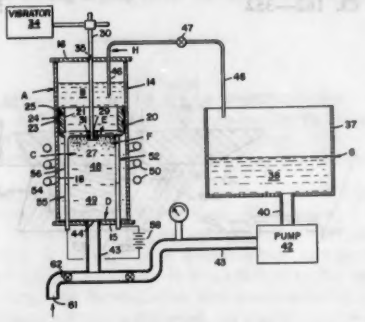
3,577,324

PROCESS OF COATING PARTICLES WITH METALS

James A. Patterson, Los Altos, Calif., assignor to Sondell Research Development Co., Palo Alto, Calif.

Filed Jan. 24, 1968, Ser. No. 700,053
Int. Cl. B01k *3/00;* **C23b** *5/60*
U.S. Cl. 204—20 **5 Claims**

A process and apparatus for simultaneously and uniformly plating numerous particles of small diameter. The apparatus comprises a column containing plating solution flowing vertically therethrough. Upper and lower transverse screens border the inside dimensions of the column interior of the plating solution and therebetween confine the particles being plated. Vibrational energy in the range of 20 to 20,000 cycles per second imparted to the plating solution strips the particles being plated of the gaseous



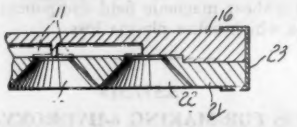
by-products of plating thereby preventing gas blinding of the plating reaction. Plating solution as vertically flowing through the plating segment moves those particles having low plating size and density into zones of the segment where plating occurs and permits those particles having the desired plating deposit thereon to settle into zones of the segment where plating is arrested.

3,577,325

METHOD OF RECLAIMING GRAPHITE MASK

Albert R. Fairchild, Winston-Salem, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

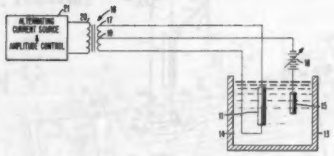
Filed May 29, 1968, Ser. No. 732,965
Int. Cl. C23b *1/00, 5/48*
U.S. Cl. 204—24 **2 Claims**



A pallet and a mask for use in the manufacture of thin film components are machined from a block of high density fine grain pressed graphite to the desired size and shape. The graphite pallet and mask are plated with a flash of copper so that the copper may be dissolved or reacted with an acid to release the layer of precious metals which accumulate during repeated use of the pallet and mask. Thin film substrates are placed in the pallet and covered by the mask. In use, the assembled pallet and

mask are inverted such that gravity forces the substrates against the mask to insure that the metal is deposited only on the desired areas of the substrate.

3,577,326
PROCESS FOR MAKING A MAGNETIC DATA STORAGE ELEMENT
Lynn C. Liebschutz, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed July 12, 1968, Ser. No. 744,401
Int. Cl. C23b *5/32*; C23c *3/00*; H01f *41/14*
U.S. Cl. 204—43 **2 Claims**



A process of making a magnetic material in the form of a film on a conductive cylindrical substrate comprises applying an alternating current to the substrate to generate an alternating orienting magnetic field circumferentially about the substrate. The orienting magnetic field strength is adjusted to produce an isotropic magnetic layer on the substrate or at higher intensities produces films with circumferentially closed easy axis. The alternating current is applied concurrently with deposition of ferromagnetic films from an electrolytic or electroless ferromagnetic bath solution. In an electroless deposition system and the electrolytic system, a direct current applied to electroplate or to initiate and sustain deposition is isolated from the alternating orienting field energization. The alternating orienting current may be sinusoidal but is preferably a square wave and has a zero D-C component.

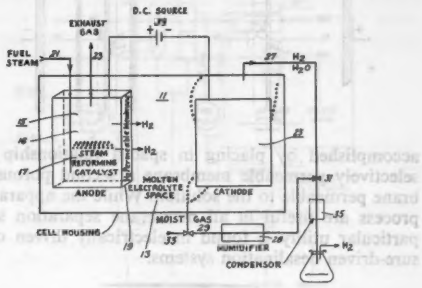
3,577,327
METHOD AND COMPOSITION FOR ELECTROPLATING CADMIUM (B)
Tibor Joachim, Vernon, and Merton M. Beckwith, Tolland, Conn., assignors to Conversion Chemical Corporation, Rockville, Conn.
No Drawing. Filed Feb. 19, 1969, Ser. No. 800,725
Int. Cl. C23b *5/10, 5/12, 5/46*
U.S. Cl. 204—50 **15 Claims**

An aqueous bath for producing bright, adherent cadmium electrodeposits upon metallic surfaces contains cadmium ion, chloride ion, a nicotinic acid and an aminopolyacetic acid type of chelating agent. The bath is highly conductive and operable at low voltages, and has a pH which is acidic or slightly alkaline.

3,577,328
METHOD AND BATH FOR ELECTROPLATING TIN
George B. Rynne, Rockville, and Merton M. Beckwith, Tolland, Conn., assignors to Conversion Chemical Corporation, Rockville, Conn.
No Drawing. Filed Nov. 7, 1968, Ser. No. 774,177
Int. Cl. C23b *5/46*
U.S. Cl. 204—54 **25 Claims**

An aqueous bath for electroplating tin upon various conductive substrates contains stannous ion, sulfate radical, an imidazoline derivative and a heterocyclic aldehyde. The bath is highly acid and is operable to produce smooth adherent deposits over a wide range of current densities and deposits of spectral brightness with the optimum formulations.

3,577,329
PROCESS FOR THE PRODUCTION OF HIGH PURITY HYDROGEN
Harold Shalit, Drexel Hill, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed Mar. 17, 1969, Ser. No. 807,865
Int. Cl. C01b *13/04*; H01m *27/20*
U.S. Cl. 204—60 **9 Claims**



An improved process and apparatus for the production of hydrogen of high purity whereby a carbonaceous fuel is reformed to produce hydrogen and said hydrogen is recovered economically from said reforming operation through the use of an electrolytic process using chemical energy of the reforming process to reduce electrical energy needed and wherein a moist gas is added to the electrolyte to facilitate the electrolytic recovery of hydrogen at the cathode.

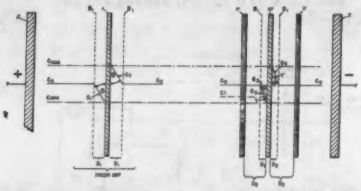
3,577,330
PROCESS FOR PRODUCING ELECTROREFINED NICKEL HAVING CONTROLLED SIZE
Burton Bower Knapp, Allendale, N.J., and Leander Ernest Cupp, Port Colborne, Ontario, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 338,309, Jan. 17, 1964. This application Nov. 17, 1967, Ser. No. 683,801
Int. Cl. C22d *1/14*; C23b *7/08*
U.S. Cl. 204—112 **7 Claims**

An improved process for producing electrorefined nickel cathode material of controlled dimension and substantial thickness wherein the nickel is deposited upon a substantially flat, permanent metal cathode mandrel such as stainless steel, and having conductive islands of controlled size defined on the surface thereof, e.g., by the use of interconnecting lines of nonconductive resist, from a nickel electrorefining catholyte containing controlled amounts of sulfur dioxide and a levelling agent to facilitate adherence of the electrodeposited nickel upon the mandrel surface by controlling the stress level therein to a tensile value not exceeding about 6,000 pounds per square inch and thereafter stripping the nickel deposit from the mandrel to recover electrodeposited nickel in sizes corresponding to the original areas of the conductive islands and to recover the mandrel in a condition suitable for further plating.

3,577,331
APPARATUS AND PROCESS FOR EFFECTING CHANGES IN SOLUTION CONCENTRATIONS
Robert E. Lacey, Homewood, Ala., and Milton S. Mintz, Stamford, Conn., assignors to the United States of America as represented by the Secretary of the Interior and Southern Research Institute
Filed June 8, 1967, Ser. No. 645,571
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 **16 Claims**

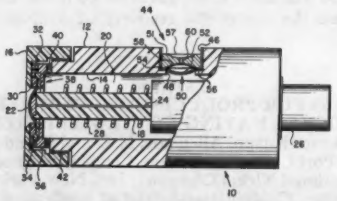
The present invention relates to an apparatus and a process for effecting changes in solution concentrations wherein a component of the solution is passed through a

separatory membrane which is selectively permeable to that component. This invention enhances the efficiency of all existing membrane separation processes by reducing the thickness of the boundary layers formed at the membrane-solution interface. The reduction in thickness is



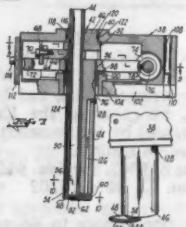
accomplished by placing in spaced relationship to the selectively permeable membrane a second porous membrane permeable to the solution. While the apparatus and process are useful in all membrane separation systems, particular utility is found in electrically driven or pressure-driven desalination systems.

3,577,332
POLAROGRAPHIC CELL
Joe A. Porter, Whittier, and Steuart L. Couch, Santa Ana, Calif., assignors to Beckman Instruments, Inc.
Filed July 12, 1967, Ser. No. 652,745
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 **4 Claims**



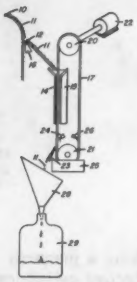
A cell for polarographic analysis of the type employing a pair of electrodes joined by an electrolyte and separated from the sample medium by a selectively permeable membrane. Pressure compensation is provided for the cell by employing an ion impermeable barrier which closes a passage leading to the eletrolyte reservoir in the cell so that contaminants outside of the cell cannot reach the electrolyte reservoir. The barrier has a sensitivity to pressure changes greater than that of the membrane so that the spacial relationship between the membrane and the sensing electrode of the cell is not influenced by changing pressure conditions.

3,577,333
APPARATUS FOR ELECTROCHEMICAL REMOVAL OF MATERIAL FROM AN ARTICLE
Edward R. Derrough, South Bend, Ind., assignor to The Bendix Corporation
Filed Sept. 24, 1968, Ser. No. 761,966
Int. Cl. B23p *1/04, 1/12*
U.S. Cl. 204—212 **4 Claims**



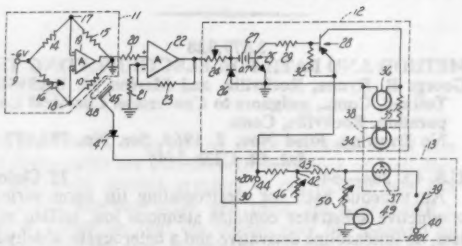
An electrochemical machining apparatus having a hollow electrode tool with a working face for eroding a core of material from a workpiece in response to a rotational input.

3,577,334
APPARATUS FOR ELECTROLYTIC RECOVERY OF A METAL FROM A SOLUTION
Charles L. Graham and Harlow R. Brigham, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 14, 1967, Ser. No. 690,621
Int. Cl. B01k *3/10*; C22d *1/02, 1/12*
U.S. Cl. 204—223 **18 Claims**



A metal is recovered from a solution in which the metal is present in ionic form by supporting a thin moving layer of the solution in contact with an electrode, impressing an electric potential across the moving layer, and mixing the solution within the layer as it travels past the electrode so as to replenish metal ions as they are depleted from immediately adjacent the electrode surface at which plating of the metal occurs. Apparatus for carrying out this method includes electrode means and a moving belt which supports the thin layer of solution in contact with the electrode means, the movement of the belt acting to ensure flow of the solution past the electrode and to simultaneously agitate the moving layer to effect mixing of the solution within the layer. The method and apparatus are of particular utility in the recovery of silver from viscous fixing solutions employed in photographic processing.

3,577,335
FEEDBACK CIRCUIT FOR ANODIZING THIN-FILM RESISTORS
Frank H. Blitchington, Jr., Greensboro, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed May 9, 1968, Ser. No. 727,948
Int. Cl. B01k *3/00*
U.S. Cl. 204—228 **6 Claims**



A thin-film resistor, which is to be anodized to increase its resistance to a preselected value is connected to one

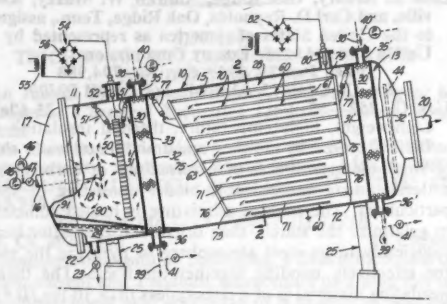
arm of a bridge circuit. As the resistor is being anodized, an imbalance in the bridge drives a monitor circuit which controls a variable resistance in series with a supply of anodizing voltage. As the thin-film resistor being anodized approaches the preselected value, the bridge becomes more nearly balanced and the variable resistor increases in value to interrupt the flow of anodizing current.

3,577,336

ELECTRIC TREATER FOR TREATING JET FUEL AND OTHER DISPERSIONS

William L. Shirley, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Aug. 23, 1968, Ser. No. 754,847
Int. Cl. B03c *5/02*
U.S. Cl. 204—302 **23 Claims**



An electric treater for removing dispersed materials from oil flowing through electric fields in side-by-side flow passages that are other than vertical. Grid electrodes having side-by-side rods are disposed in the central planes of the flow passages. With such or other electrode configurations in an electric treating chamber, oil flows into or from the latter through a space packed with masses, usually solids, that can be continuously or periodically replaced. The masses may have surface properties or coatings facilitating the separation of the dispersed material from the oil or such masses or materials coating or impregnating same may be reactive with some component of the oil.

3,577,337

SOLVENT EXTRACTION OF COAL

Theodore Kessler, Andrew G. Sharkey, Jr., Joseph Malli, Jr., and Robert A. Friedel, Pittsburgh, Pa., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Mar. 11, 1970, Ser. No. 18,693
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 **7 Claims**

Coal is extracted in quinoline by treatment of a coal-quinoline slurry with ultrasonic irradiation at ambient temperature. The quinoline may then be removed from the solubilized coal fraction by conversion to a water-soluble quinoline salt. The solubilized fraction may be used for production of gasoline, aromatic chemicals, carbon black, electrode carbons, low-sulfur and -ash fuels for power plants, etc.

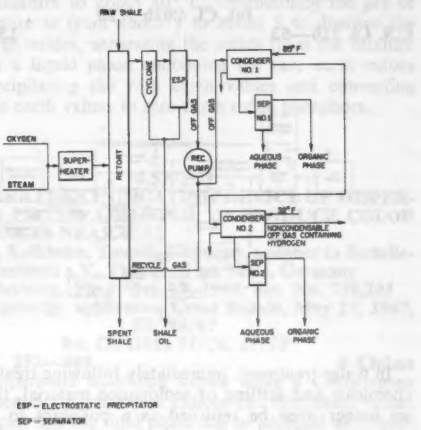
3,577,338

PROCESS FOR RECOVERY OF OIL FROM OIL SHALE SIMULTANEOUSLY PRODUCING HYDROGEN

Phillip H. Gifford II, Carbondale, Colo. (1824 K 4/10 Road, Fruita, Colo. 81521)

Filed Feb. 19, 1969, Ser. No. 800,594
Int. Cl. C10b *53/06*
U.S. Cl. 208—11 **11 Claims**

A process for retorting oil shale and simultaneously producing hydrogen as a by-product with high yields of both oil and hydrogen, the process comprising continuously passing oil shale through a combustion zone in a retort while continuously introducing steam and oxygen into the combustion zone, removing spent shale below the



combustion zone and recovering oil and hydrogen from the retort off gas from the combustion zone. Hydrogen is produced by the reaction of carbon containing material with steam.

3,577,339

FILTRATION METHOD OF SEPARATING LIQUIDS FROM EXTRANEOUS MATERIALS

Justus N. Baird, Jr., Kingston, and James S. Johnson, Kurt A. Kraus, and Joseph J. Perona, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Continuation of application Ser. No. 718,231, Apr. 2, 1968. This application Jan. 29, 1970, Ser. No. 7,387
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **3 Claims**

A cross flow filtration method of separating a liquid from extraneous material comprising establishing a filtering medium comprising a bed of fine particles dispersed on a porous substrate and forcing a liquid across said filtering medium under conditions whereby a portion of said liquid passes through said filtering medium.

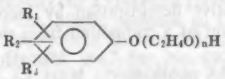
3,577,340

METHOD FOR DISPERSING OIL SPILLS ON WATER

Stanley C. Paviak, Shaler Township, Warren K. Porter, Jr., Richland Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,295
Int. Cl. B01d *17/04*
U.S. Cl. 210—42 **9 Claims**

A method for dissipating oil spills in water by dispersing the spilled oil with a novel alkylphenol ethoxylate having the structural formula



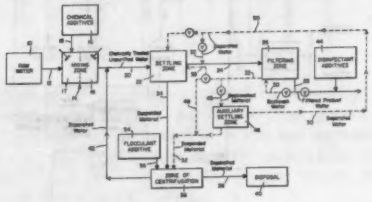
wherein n is an integer from about 5 to about 25, R_1 is an alkyl group having at least 20 carbon atoms and R_2 and R_3 are independently selected from said alkyl group and hydrogen; and mixtures of the same.

3,577,341

WATER TREATMENT

Frederick W. Keith, Jr., Gladwyne, Everett M. Jones, Ardmore, and Joseph R. Townsend, Jr., West Chester, Pa., assignors to Pennwalt Corporation

Filed Oct. 18, 1968, Ser. No. 768,848
Int. Cl. C02b 1/20
U.S. Cl. 210—53 13 Claims



In water treatment, immediately following treating with chemicals and settling of sedimented material, the latter no longer need be returned as a pollutant to a water course, or otherwise disposed of. Rather, the sedimented material is centrifugally concentrated for convenient disposal in compact form and the water separated therefrom may be reprocessed.

3,577,342

FIRE-RESISTANT FINISH FOR TEXTILES COMPRISING ZINC FLUOROBORATE

Louis Isadore Fidell, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 647,603, June 21, 1967, which is a continuation-in-part of application Ser. No. 457,209, May 19, 1965. This application Sept. 2, 1969, Ser. No. 854,750
Int. Cl. C09k 3/28
U.S. Cl. 252—8.1 4 Claims

Fire retardant finishing compositions, especially useful for synthetic fibers, incorporating zinc fluoroborate and emulsification and other additives to maintain the desirable hand and feel of the textile material.

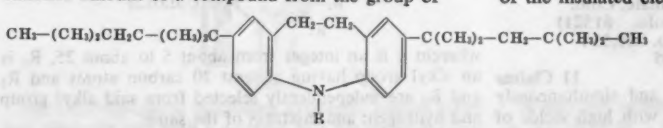
3,577,343

DIBENZAZEPINE COMPOUNDS AS STABILIZER FOR OXIDIZABLE ORGANIC COMPOSITIONS

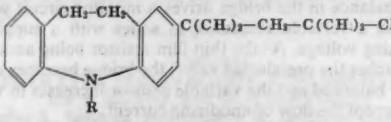
Hans Jakob Peterli, Fullingsdorf, Switzerland, and Donald Richard Randell, Stockport, England, assignors to Geigy Chemical Corporation, Greenburgh, N.Y.

No Drawing. Division of application Ser. No. 588,225, Oct. 20, 1966, now Patent No. 3,475,412, which is a continuation of application Ser. No. 523,539, Jan. 28, 1966, which is a continuation-in-part of application Ser. No. 424,210, Jan. 8, 1965, which in turn is a continuation-in-part of application Ser. No. 158,169, Dec. 8, 1961. This application Oct. 27, 1969, Ser. No. 870,959
Int. Cl. C10m 1/32; C08f 45/60
U.S. Cl. 252—51.5 7 Claims

Oxidizable organic materials are rendered less susceptible to oxidative deterioration by incorporation of an effective amount of a compound from the group of



and an N-substituted azepine compound of the formula



in which formulas R is a member selected from the group consisting of hydrogen, alkyl having from 1 to 12 carbon atoms, hydroxy-substituted lower alkyl, phenyl-substituted lower alkyl, benzoyl and alkanoyl with 1 to 8 carbon atoms.

3,577,344

FIBROUS THERMAL INSULATION AND METHOD OF MAKING SAME

Zane L. Ardary, Oak Ridge, Andrew W. Maxey, Knoxville, and Carl D. Reynolds, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 29, 1969, Ser. No. 794,980
Int. Cl. C04b 43/02; E04b 1/76; F16l 59/00
U.S. Cl. 252—62 11 Claims

Lightweight, high-temperature, thermal insulating material is prepared by molding an admixture or water slurry of small-diameter fibers of a refractory or carbonaceous material and a carbonizable binder consisting of starch particulates. The molded admixture is heated sufficiently to gelatinize the starch, then dried, and thereafter heated sufficiently in an inert atmosphere to pyrolyze the starch for effectively bonding together the fibers. The thermal insulating material is of a density less than 10 lbs./ft.^{3} and has a thermal conductivity of less than about 1 B.t.u.-in./hr.-° F.-ft.^{2} at a temperature of 1400° F.

3,577,345

SOLID XEROGRAPHIC DEVELOPER

Burton B. Jacknow and Joseph H. Moriconi, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

No Drawing. Filed June 5, 1967, Ser. No. 643,394
Int. Cl. G03g 9/02
U.S. Cl. 252—62.1 9 Claims

A finely-divided low melting toner comprising a colorant, a thermoplastic resin comprising a vinyl resin, a solid metal salt of a fatty acid, and a solid additive having a melting point between about 115° F. to about 270° F. comprising a benzoate, a sulphonamide or a polychlorinated polyphenyl compound.

3,577,346

INSULATED ELECTRICAL CONDUCTORS HAVING CORONA RESISTANT POLYMERIC INSULATION CONTAINING ORGANO METALLIC COMPOUNDS

James J. McKeown, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 555,695, June 7, 1966. This application Nov. 14, 1968, Ser. No. 775,958
Int. Cl. C08f 45/62; C08g 51/62; H01b 3/28
U.S. Cl. 252—63.5 49 Claims

Insulated electrical conductors having improved corona resistance comprising a metal conductor surrounded by a major portion of a dielectric polymer containing intermixed therewith a minor amount of an organo-metallic compound of a metal selected from silicon, germanium, tin, lead, phosphorous, arsenic, antimony, bismuth, iron, ruthenium and nickel and a method for the preparation of the insulated electrical conductors.

ERRATUM

For Class 252—73 see:
Patent No. 3,577,361

3,577,347
WATER-SOLUBLE SCOURING COMPOSITION
John Alexander Monick, 102 Jasper Ave., Teaneck, N.J. 07666
No Drawing. Filed Apr. 3, 1968, Ser. No. 718,325
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 4 Claims

A stable nongritty cleanser composition comprising a detergent, bleach, and a water soluble salt, said salt having less than 6 molecules of water of hydration.

3,577,348
TRICHLOROTRIFLUOROETHANE WATER EMULSION SYSTEM
John Joseph Clementson, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed May 1, 1968, Ser. No. 725,897
Claims priority, application Great Britain, May 8, 1967, 21,221/67, 21,222/67; Aug. 14, 1967, 37,321/67, 37,719/67
Int. Cl. C11d *1/12, 7/50;* B01f *17/10*
U.S. Cl. 252—153 16 Claims

Cleaning compositions containing a fluorochlorohydrocarbon solvent and a sodium, ammonium or amine salt of a monosulphonic acid derivative of a di-ester of succinic acid, optionally also containing a non-ionic surfactant, ammonia, water and a stabilizer for the said solvent.

3,577,349
COMPOSITION FOR DESTROYING HARDENED CEMENTITIOUS MIXTURES
Robert Glenn Haines, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Jan. 31, 1969, Ser. No. 795,709
Int. Cl. C09d *9/00;* C11d *7/05;* C23g *5/02*
U.S. Cl. 252—170 8 Claims

A composition for destroying hardened cementitious mixtures comprising methyl acetoacetate and water. A method for destroying hardened cementitious mixtures utilizing said composition is also covered.

3,577,350
EUROPIUM AND MANGANESE ACTIVATED SODIUM OR POTASSIUM ALUMINATE PHOSPHORS
Robert L. Amster, Great Neck, N.Y., assignor to General Telephone & Electronics Laboratories, Incorporated
Filed Nov. 27, 1968, Ser. No. 786,804
Int. Cl. C09k *1/68*
U.S. Cl. 252—301.4 6 Claims

A phosphor system consisting of an alkali metal β-alumina activated by divalent europium or by divalent europium together with divalent manganese. These phosphors are photoluminescent and cathodoluminescent and are suitable for use in fluorescent lamps or cathode ray tube screens.

3,577,351
METHOD FOR THE RECOVERY OF RARE EARTH OXIDES
Robert E. Dodds, Wysox, Pa., assignor to Sylvania Electric Products Inc.
No Drawing. Filed Jan. 30, 1969, Ser. No. 795,346
Int. Cl. C09k *1/10*
U.S. Cl. 252—301.4 10 Claims

A process is disclosed that is suitable for recovering rare earth oxide phosphors from an impure material containing rare earth oxides contaminated with other phosphors used in color television cathode ray tubes. The process comprises: heating the impure material to remove volatile material, forming an aqueous material containing the impure rare earth material, adjusting the temperature of the mixture to about 80° C., maintaining the pH of the mixture at from about 3 to about 5 to dissolve the rare earth oxides, separating the solids from the mixture to form a liquid phase containing the rare earth values and precipitating the rare earth values and converting said rare earth values to rare earth oxide phosphors.

3,577,352
TEMPERATURE INDICATING DEVICE OF DISPERSION FILTER ADJUSTED TO PRODUCE COLOR CHANGES NEAR 0° C.
Jan Bol, Kelkheim, Taunus, Germany, assignor to Battelle-Institute e.V., Frankfurt am Main, Germany
No Drawing. Filed May 17, 1968, Ser. No. 730,201
Claims priority, application Great Britain, May 17, 1967, 58,798/67
Int. Cl. G01k *11/16, 11/18*
U.S. Cl. 252—408 8 Claims

A temperature indicating device using a Christiansen filter wherein the refractive indices and dispersion values of the solid and the fluid phase are so adjusted as to produce color changes near the freezing point.

3,577,353
PREPARATION OF A COGELLED CATALYST OF ALUMINA AND A GROUP VI HYDROGENATING COMPONENT
Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Nov. 22, 1968, Ser. No. 778,332
Int. Cl. B01j *11/34, 11/40*
U.S. Cl. 252—465 2 Claims

A hydrofining catalyst is prepared by cogelation of hydrous alumina and a Group VI metal or metal compound, washing said gel to remove occluded salts and then contacting the washed gel with an organic solvent before the gel is dried and calcined. This contacting step, which may be carried out with methanol or ethanol, serves to extract water from the hydrous gel and thus provides less shrinkage of the gel after final drying.

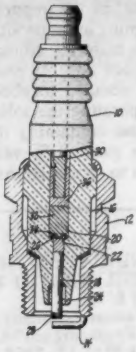
3,577,354
MAGNESIUM CHROMIUM FERRITE CATALYST
William L. Kehl, Indiana Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Division and continuation-in-part of application Ser. No. 493,222, Oct. 5, 1965. This application June 27, 1969, Ser. No. 837,376
Int. Cl. B01j *11/06, 11/32*
U.S. Cl. 252—468 13 Claims

A hydrocarbon conversion catalyst comprising magnesium, chromium, iron and oxygen in a magnesium chromium ferrite spinel-type structure.

3,577,355
RESISTOR COMPOSITION
Jack F. Blum, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 21, 1967, Ser. No. 692,485
Int. Cl. H01t *13/36;* H01b *1/02*
U.S. Cl. 252—512 6 Claims

An improved resistor composition for use in resistor spark plugs and other electrical devices is disclosed. The resistor composition contains a metal powder taken from the group consisting of zinc, antimony and tellurium in

addition to the conventional resistor composition ingredients. The metal, for example, zinc, causes the resistor



mass to bond tightly to the center electrode head in the spark plug insulator centerbore.

3,577,356

HIGHLY FLUORINATED POLYMERS

Floyd D. Trischler and Jerome Hollander, San Diego, Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

No Drawing. Filed Feb. 23, 1968, Ser. No. 707,440
Int. Cl. C08g *23/00, 33/00*
U.S. Cl. 260—2 **7 Claims**

This patent describes novel hydroxy containing polyethers which are prepared by the base polymerization of 2-hydro-perhaloisopropyl alcohols having the formula

$$CF_2-\underset{\displaystyle OH}{\underset{|}{CH}}-CF_2X$$

wherein X is fluorine, chlorine, bromine or iodine.

3,577,357

SELECTIVELY SULFONATED BLOCK COPOLYMERS

De Loss E. Winkler, Orinda, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Nov. 29, 1968, Ser. No. 780,179
Int. Cl. C08j *1/34*
U.S. Cl. 260—2.2 **7 Claims**

Block copolymers exhibiting water absorption characteristics indicating their use in water purification membranes and the like comprise block copolymers having sulfonated polyvinyl arene blocks and alpha-olefin elastomeric blocks, the sulfur content of the copolymers varying from about 1% by weight to one sulfonated radical per monovinyl arene unit.

3,577,358

ORGANIC ISOCYANATE-LIGNIN REACTION PRODUCTS AND PROCESS

Thomas R. Santelli, Sylvania, and Robert T. Wallace, Toledo, Ohio, assignors to Owens-Illinois, Inc.

No Drawing. Continuation-in-part of application Ser. No. 846,822, Oct. 16, 1959. This application Feb. 10, 1967, Ser. No. 615,072
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 **16 Claims**

New polymeric materials, such as synthetic resins, foamed cellular synthetic resins, and the like, are formed by reacting an organic polyisocyanate with lignin, preferably in the presence of varying amounts of catalysts, plasticizers, emulsifiers, solvents, and co-reactants, depending upon the desired characteristics of the final product. Such product has repeating urethane linkages in the molecule. Products of the invention are suitable for many uses, among which uses are as foams, plastics, adhesives, etc.

3,577,359

METHOD OF RETICULATING NYLON MATERIALS

Frank E. Carevic and Theodore H. Fairbanks, West Chester, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Feb. 5, 1968, Ser. No. 703,068
Int. Cl. C08g *53/08, 53/20*
U.S. Cl. 260—2.5 **7 Claims**

A foamed nylon material, formed of contacting cells which provide a skeletal structure of interconnected strands with membranes partitioning contiguous cells and joined to the skeletal structure, is exposed to a solution of a strong acid and a non-aqueous solvent to remove the cell membranes, leaving the skeletal structure of nylon material which is suitable, for example, as a filter.

ERRATUM

For Class 260—2.5 see:
Patent No. 3,577,554

3,577,360

PROCESS FOR PRE-EXPANDING POLYMER BEADS

Richard H. Immel, Sewickley, Pa., assignor to Sinclair-Koppers Company

Filed Oct. 7, 1968, Ser. No. 765,342
Int. Cl. B29d *1/00;* **B29h** *7/20*
U.S. Cl. 264—53 **5 Claims**

An apparatus and process are provided for expanding polymeric particles to a predetermined density, which particles are subject to further expansion. Agitated particulate expandable polymer is heated in a dry atmosphere in a closed vessel, under vacuum, to a predetermined density. To achieve ultra-low density expandable prepuff, a coolant such as water is introduced into the closed vessel after the predetermined density is reached, but prior to the release of the vacuum. Following release of the vacuum, the beads are removed from the closed vessel and may be molded directly, without any aging period such as that necessary following steam preexpansion.

3,577,361

SYNTHETIC POWER TRANSMISSION FLUIDS

William C. Hammann, Creve Coeur, and Robert M. Schisla, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 22, 1968, Ser. No. 731,254
Int. Cl. C09k *3/00*
U.S. Cl. 252—73 **6 Claims**

An improved method of transmitting power in hydraulically-operated mechanisms which comprises using as the operative fluid certain tetraalkyl substituted alkylene-linked dicyclohexyl compounds.

3,577,362

METHOD OF MANUFACTURING URETHANE FOAM BY THE USE OF POLY(VINYL-ALKOXY SILANES)

Kihachi Tamura, Musashino-shi, and Isao Nakajima and Kaname Inoue, Tokyo, Japan, assignors to Shin-Etsu Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Original application Jan. 29, 1964, Ser. No. 341,123, now Patent No. 3,461,148, dated Aug. 12, 1969. Divided and this application Oct. 30, 1968, Ser. No. 785,431
Claims priority, application Japan, Jan. 29, 1963, 38/3,960; Jan. 31, 1963, 38/4,970, 38/4,971; Feb. 1, 1963, 38/5,069
Int. Cl. C08g *22/46, 53/08*
U.S. Cl. 260—2.5 **8 Claims**

A process for manufacturing a polyoxyalkylene polyvinylsilane by condensing a polyoxyalkylene compound

with a vinylsilane and polymerizing the resulting condensate in the presence of the catalyst selected from organic peroxides and organic azo compounds, the polyoxyalkylene polyvinylsilanes so produced and use of the polyoxyalkylene polyvinylsilane as a surfactant in the manufacture of polyurethane foam.

3,577,363

CELLULAR PLASTICS MATERIAL CONTAINING POLYSTYRENE AND A PROCESS FOR ITS MANUFACTURE

Oluf Walter Henry Klug, Stockholm, Sweden, assignor to AB Electrolux, Stockholm, Sweden

No Drawing. Filed June 20, 1969, Ser. No. 835,214
Claims priority, application Sweden, July 5, 1968, 9,319/68
Int. Cl. C08f *47/10*; C08g *53/10*
U.S. Cl. 260—2.5 **10 Claims**

A material consisting of closed cells of polystyrene which are surrounded by cured urea formaldehyde resin is produced in the following manner: Small, enexpanded polystyrene particles are mixed with urea formaldehyde resin in a liquid medium; the urea formaldehyde resin is then converted to a foam and cured in the form of this foam without any substantial expanding of the polystyrene particles; after the curing step, the polystyrene particles are expanded by heating.

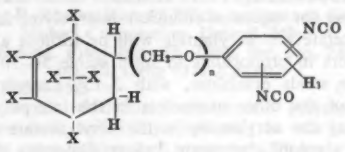
3,577,364

COMPOSITIONS OF MATTER

Daniel S. Raden, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Original application Oct. 22, 1965, Ser. No. 502,552, now Patent No. 3,509,199, dated Apr. 28, 1970. Divided and this application June 17, 1968, Ser. No. 761,358
Int. Cl. C08g *22/24, 22/26, 22/44*
U.S. Cl. 260—2.5 **6 Claims**

The subject matter of this application is a new flame retardant rigid cellular plastic foam prepared from (5-methylene - 1,2,3,4,7,7 - hexachlorobicyclo[2.2.1] - 2-heptenyl)-2,4-diisocyanatophenyl ether, or compounds generically defined as



wherein X is halogen and *n* is 0 or 1.

3,577,365

NOVEL BLENDS OF CHLORINATED CARBOXYL GROUP CONTAINING POLYMERS AND ETHYLENE-VINYL ACETATE COPOLYMERS

Paul D. Folzenlogen and Hugh J. Hagemeyer, Jr., Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Feb. 7, 1969, Ser. No. 797,703
Int. Cl. C08f *29/12*
U.S. Cl. 260—4 **12 Claims**

Compositions comprising blends of chlorinated carboxyl group containing polymers and ethylene-vinyl acetate copolymers. These compositions provide tough, flexible coatings having excellent adhesion to various substrates. These coatings have good resistance to chemical and solvent attack and embrittlement on aging and are useful in the protective coatings field.

3,577,366

9,10-BRIDGED ANTHRACENE COMPOUNDS

Bruce H. Klanderman, Rochester, and Jan W. H. Faber, Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Application Feb. 17, 1967, Ser. No. 616,789, now Patent No. 3,457,235, which is a continuation-in-part of application Ser. No. 530,381, Feb. 28, 1966. Divided and this application Mar. 28, 1969, Ser. No. 811,655
Int. Cl. C07c *31/14*
U.S. Cl. 260—618 **8 Claims**

New 9,10 - bridged anthracene compounds, such as 9,10 - bis(hydroxymethyl)triptycene and 9,10 - dihydro-9,10 - bis(hydroxymethyl) - 9,10 - ethanoanthracene improve certain properties of polyesters prepared by polymerization of a dicarboxylic acid, such as terephthalic acid, and an alkylene glycol, such as ethylene glycol, when incorporated in the polymerization mixture. The 9,10-bis(acyloxyalkyl) - 9,10 - bridged anthracene compounds from which the anthracene compounds used in preparing the polyesters are prepared are new compounds.

3,577,367

FOUNDRY SAND COMPOSITIONS CONTAINING GRAFT COPOLYMERS OF ACRYLIC ACID WITH METHYL CELLULOSE

William J. Lang, Libertyville, Ill., assignor to International Minerals & Chemical Corporation

No Drawing. Filed Sept. 4, 1968, Ser. No. 757,469
Int. Cl. C08f *29/36*; B22c *1/26*
U.S. Cl. 260—17 **15 Claims**

A sand core and mold composition for use in casting metals comprising foundry sand, clay, water and from about 0.0025% to about 1% by weight of a water-soluble graft copolymer of acrylic acid and a minor amount of methyl cellulose, including water-soluble salts thereof.

3,577,368

BARK FIBER AS A REINFORCING AND STABILIZING AGENT FOR HIGH TEMPERATURE MOLDING THERMOPLASTICS

Hubert E. Hendrickson and Charles N. McCain, Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

No Drawing. Filed Mar. 8, 1967, Ser. No. 621,436
Int. Cl. C08f *29/10, 45/18*
U.S. Cl. 260—17.4 **4 Claims**

The invention comprises the use of Douglas fir bark fiber as a stabilizer for polypropylene molding compounds. The bark fibers may be incorporated into the molding compound by simple blending methods to provide a homogeneous molding premix, yet provide superior physical properties to the article of manufacture as well as improved heat stability.

3,577,369

BARK FIBER AS A DISPERSING AGENT FOR HIGH TEMPERATURE MOLDING THERMOPLASTICS

Hubert E. Hendrickson and Charles N. McCain, Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

No Drawing. Filed Mar. 8, 1967, Ser. No. 621,420
Int. Cl. C08f *45/18*
U.S. Cl. 260—17.4 **4 Claims**

The invention comprises the use of Douglas fir bark fiber as a dispersing agent for reinforced polypropylene molding compound which can be used at elevated molding conditions. The bark fiber may be incorporated into the reinforced molding compound by simple blending methods to provide a homogeneous molding premix, yet provide the article manufactured and produced thereby with the reinforcing material dispersed uniformly therein.

ERRATUM

For Class 260—17.4 see:
Patent No. 3,577,555

3,577,370
MODIFIER FOR PHENOLIC RESINS
Anthony J. Castro, Oak Park, Frederick S. Marsh, Chicago, Layton E. Kinnney, Villa Park, and Frank J. Fischl, Chicago, Ill., assignors to Armour Industrial Chemical Company, Chicago, Ill.
No Drawing. Filed Aug. 5, 1968, Ser. No. 749,946
Int. Cl. C08g *37/18*
U.S. Cl. 260—19 **8 Claims**

Hydroxyphenylstearic acid-phenol copolymers with aldehyde bridging, useful with epoxy resins as coating compositions.

3,577,371
NITRILOTRIACETIC ACID ALKYD RESINS
Noel D. Blair, Grand Island, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Nov. 13, 1967, Ser. No. 682,586
Int. Cl. C08g *17/04, 17/16;* **C09d** *3/64*
U.S. Cl. 260—22 **12 Claims**

There are provided: Novel nitrilotriacetic acid alkyd resins and their water soluble ammonium or amine salts having utility as coating compositions on metal.

3,577,372
HOT MELT ADHESIVE COMPOSITIONS
Thomas P. Flanagan, Green Brook, and Irving I. Kaye, Murray Hill, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.
No Drawing. Filed July 30, 1968, Ser. No. 748,607
Int. Cl. C08f *45/52;* **C09j** *3/14, 7/00*
U.S. Cl. 260—23 **6 Claims**

Hot melt adhesive compositions comprising a blend of an atactic polypropylene resin and an aliphatic petroleum hydrocarbon tackifying resin. The resulting hot melts are utilizable in a variety of packaging, laminating and specialty hot melt applications.

3,577,373
WAX COMPOSITIONS CONTAINING AN ETHYLENE-ISOBUTYLACRYLATE COPOLYMER AND AN ORGANIC ACID
Charles J. Kremer, Brookhaven, and Donald S. Brown, Havertown, Pa., Dominic Apikos, Laurel Springs, N.J., and John T. Thean, Philadelphia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,408
Int. Cl. C08f *21/04, 45/52*
U.S. Cl. 260—23 **18 Claims**

This invention relates to wax compositions containing an acid component and an ethylene-isobutylacrylate copolymer. These compositions have highly improved resistance to stress cracking, and improved break energy and film toughness. They can be utilized as hot melt coatings for items such as paperboard and corrugated board for use in the food packaging industry.

3,577,374
COATING COMPOSITIONS COMPRISING POLYVINYL ACETAL
Robert A. Isaksen, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 624,702, Mar. 21, 1967. This application Dec. 26, 1968, Ser. No. 787,251
Int. Cl. C09d *3/74, 5/08, 5/10*
U.S. Cl. 260—23 **11 Claims**

Disclosed herein is a coating composition for application to various surfaces particularly wood or metal. When applied to metal, it is not necessary that the metal be previously cleaned of oxidation products and/or greasy, oily contaminants. The coating is based upon a blend of polyvinyl acetal and a styrene-alcohol interpolymer, such as styrene-allyl alcohol interpolymer, and/or esters and/or ester adducts thereof. Optionally, the coating may also contain chromium trioxide and/or aluminum powder.

3,577,375
STABLE AQUEOUS DISPERSIONS OF ETHYLENE POLYMERS PRODUCED BY CONTACTING THE DISPERSIONS WITH AN ACIDIC SULFONATED CATION EXCHANGE RESIN CHARGED WITH AMMONIUM IONS
Bert H. Clampitt, Overland Park, Kans., assignor to Gulf Research & Development Compnay, Pittsburgh, Pa.
No Drawing. Continuation of application Ser. No. 585,283, Oct. 10, 1966. This application June 20, 1969, Ser. No. 835,249
The portion of the term of the patent subsequent to May 12, 1987, has been disclaimed
Int. Cl. C08f *27/00*
U.S. Cl. 260—29.6 **10 Claims**

Stable aqueous dispersions of water-insoluble, self-emulsifiable ethylene-alkyl acrylate polymers substantially free of metallic cations are obtained by contacting aqueous dispersions of water-insoluble, self- emulsifiable ethylene-alkyl acrylate polymers containing metallic cations with a strongly acidic cation exchange resin charged with ammonium ions.

3,577,376
INTERPOLYMERIZATION OF ACRYLAMIDE, VINYL ACETATE AND OTHER MONOMERS BY USING A SOLUBILIZING AGENT TO DISSOLVE THE ACRYLAMIDE IN THE VINYL ACETATE
Raymond Lanthier, Pierrefonds, Quebec, and Lorenzo Ouellet, Dorion, Quebec, Canada, assignors to Gulf Oil Canada Limited, Toronto, Ontario, Canada
No Drawing. Continuation-in-part of application Ser. No. 688,348, Dec. 6, 1967. This application Oct. 24, 1968, Ser. No. 770,441
Int. Cl. C08f *1/08, 15/16*
U.S. Cl. 260—29.6 **11 Claims**

Process for aqueous emulsion interpolymerization of vinyl acetate and acrylamide with or without additional monomers in proportions to form stable 50–70% interpolymer solids emulsions, with 2–15% acrylamide by weight of the other monomers in the interpolymer, by dissolving the acrylamide in the vinyl acetate with the aid of a solubilizing agent before dispersing the monomers in an aqueous medium for interpolymerization. Examples of suitable specific solubilizing agents are methanol and formamide, materials which render acrylamide soluble in vinyl acetate and do not interfere with subsequent interpolymerization nor adversely affect the properties of the resulting interpolymer emulsion.

3,577,377
POLYESTER TIRE CORD ADHESIVE DIPS
Wun T. Tai, Monroeville, Pa., assignor to Koppers Company, Inc.
No Drawing. Filed Nov. 29, 1968, Ser. No. 780,208
Int. Cl. C08d *7/00;* **C09d** *5/02*
U.S. Cl. 260—29.7 **1 Claim**

Adhesive dips suitable for the bonding of polyester fibers to rubber in the manufacture of reinforced rubber articles are prepared from tris(monohydroxybenzyl) phenol and an aqueous rubber latex.

3,577,378

GLASS FIBER REINFORCED POLYCARBONATES

Hugo Streib and Wilhelm Hechelhammer, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of application Ser. No. 439,082, Mar. 11, 1965. This application Sept. 9, 1968, Ser. No. 758,614

Claims priority, application Germany, Mar. 12, 1964, F 42,281

Int. Cl. C08g *51/10*

U.S. Cl. 260—37 8 Claims

The invention meets with a process for the production of glass fiber reinforced polycarbonates by introducing milled, filamentized, water-sized glass fibers into a solution or a melt of polycarbonate resin, removing the solvent if necessary and extruding the glass fiber containing melt through a nozzle.

3,577,379

DARK COLORED COATINGS OF HIGH SOLAR HEAT REFLECTANCE

Melvin H. Sandler, Baltimore, and Merrill Cohen, Havre de Grace, Md., assignors to the United States of America as represented by the Secretary of the Army

Continuation-in-part of abandoned application Ser. No. 567,162, July 22, 1966. This application Mar. 11, 1969, Ser. No. 834,571

Int. Cl. C08g *51/04*

U.S. Cl. 260—40 5 Claims

A dark colored coating of high solar heat reflectance utilized to minimize heat build-up in the interior of objects exposed to sunlight comprising a mixture of pigments having a high-infrared reflectance such as quinacridone red, the violet to red shade of carbazole dioxazine, and titanium dioxide in combination with pigments such as lead chromate, molybdate orange, and phthalocyanine blue in order to obtain an acceptable color match. The pigment mixture is dispersed with extender pigments and suitable vehicles together with driers, volatile solvents, antioxidants, wetting agents, stabilizers and other additives of the art to form an enamel.

3,577,380

CROSS-LINKED CARBOXYLATED ELASTOMERS

Charles R. Binder, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

No Drawing. Filed June 28, 1968, Ser. No. 740,981

Int. Cl. C08g *41/00, 41/02*

U.S. Cl. 260—41.5 5 Claims

The strength of uncured elastomeric polymers containing pendant carboxyl groups may be markedly improved by cross-linking such elastomers through the carboxyl groups with polymethylene polyphenylisocyanate. In a preferred embodiment, a filler material containing reactive hydroxyl groups is incorporated into the curable mixture for additional cross-linking and further improvement in physical strength.

3,577,381

HEAT STABILIZATION OF POLYESTER RESIN WITH PHENYLPHOSPHINIC ACIDS

Mary J. Stewart, Riddlewood, Media, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Apr. 25, 1968, Ser. No. 724,280

Int. Cl. C08g *51/58*

U.S. Cl. 260—45.7 9 Claims

A composition including a high molecular weight, thermoplastic linear polyester resin and a heat stabilizing amount of diphenyl phosphinic acid or phenyl phosphinic acid, is disclosed herein.

3,577,382

POLYMERIC COMPOSITIONS COMPRISING ORGANO-AMINO-PHOSPHONATE ESTERS

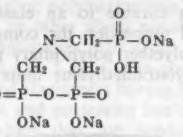
Al F. Kerst, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 759,250, Sept. 11, 1968. This application June 11, 1969, Ser. No. 832,441

Int. Cl. C09k *3/28*

U.S. Cl. 260—45.8 13 Claims

This invention relates to polymeric compositions containing esters, salts and acids of partial anhydrides of organophosphonates which include such a compound as shown below.



ERRATUM

For Class 260—45.85 see:
Patent No. 3,577,556

3,577,383

DIBUTYL THIO UREA AS A UV ABSORBER FOR POLYURETHANES

Grant O. Sedgwick, Minneapolis, Minn., assignor to Ashland Oil, Inc., Ashland, Ky.

No Drawing. Filed Nov. 1, 1966, Ser. No. 591,129

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.9 5 Claims

Aromatic diisocyanate derived polyurethanes which inherently exhibit a pronounced tendency toward discoloration upon exposure to UV light are stabilized against such deleterious effect by the presence therein of a small amount of a dialkyl substituted thio urea.

3,577,384

STABILIZED MOULDING COMPOSITIONS FROM POLYMERS OF α-OLEFINS

Otto Mauz, Niederhofheim, Taunus, and Eberhard Prinz, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed July 7, 1969, Ser. No. 839,713

Claims priority, application Germany, July 10, 1968, P 17 69 765.3

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.85 4 Claims

Moulding compositions from polyolefins and a stabilizer mixture which consists of a tetraphenol and a dialkyl disulfide which are especially suitable for the manufacture of shaped articles coming into contact with hot water.

3,577,385

POLYURETHANE ELASTOMERS PREPARED BY REACTING A MIXTURE OF A POLYOXYALKYLENE ETHER DIOL OF A DIHYDRIC PHENOL AND A POLYOXYALKYLENE ETHER OF A POLYOL WITH AN ORGANIC POLYISOCYANATE

Joseph Feltzin and Nadji Y. Tehrani, Wilmington, Del., assignors to Atlas Chemical Industries, Inc., Wilmington, Del.

No Drawing. Filed May 15, 1967, Ser. No. 638,630

Int. Cl. C08g *22/26*

U.S. Cl. 260—47 8 Claims

Polyurethanes having improved properties are prepared by reacting polyoxyalkylene ether diols containing a carboxycyclic or oxacyclic ring and from 2 to 10 oxyalkylene

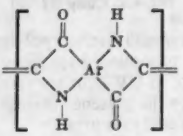
groups, polyoxyalkylene ether polyols containing from 5 to 10 hydroxyl groups and from 15 to 90 oxyalkylene groups, and organic polyisocyanates.

3,577,386
PRODUCT AND PROCESS
John E. Maier, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,676
Int. Cl. C08g 30/14, 30/16
U.S. Cl. 260—47 12 Claims

A composition curable to an elastomer having outstanding physical properties, the composition having an epoxy resin, a polyether polyprimary polyamine containing recurring oxytetramethylene units and a tin acylate dissolved therein.

3,577,387
PROCESS OF PREPARING HEAT-RESISTANT POLYMERS
Hilde Kersten, Mechenhard, Erhard Siggel, Seckmauern, and Gerhard Meyer, Obernburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany
No Drawing. Filed Jan. 3, 1969, Ser. No. 788,931
Claims priority, application Germany, Jan. 8, 1968, P 17 20 884.3
Int. Cl. C08g 15/00
U.S. Cl. 260—47 3 Claims

A high molecular weight polymer having recurring units of the formula



wherein Ar is one of the tetravalent aromatic radicals selected from the class consisting of phenylene, diphenylene, naphthylene, diphenylether and diphenylmethane as derived from a condensed aromatic bis-(2,4-dihydroxypyridine) compound by the steps of chlorination, alkoxylating, decarboxylating and finally polymerizing in an acid medium at about 20–300° C. Preferred long chain or relatively higher molecular weight polymers are achieved by polymerizing in inorganic non-oxidizing acids especially in polyphosphoric acid. The polymers are especially useful where stability to high temperatures and solvents is required.

3,577,388
FIBER PREPARED FROM POLYESTER BASED POLYURETHANE PREPOLYMER
Ignazio Salvatore Megna and Anthony Koroscil, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Continuation-in-part of application Ser. No. 566,229, July 19, 1966. This application May 14, 1969, Ser. No. 824,685
Int. Cl. C08g 22/10, 22/16
U.S. Cl. 260—75 2 Claims

Polyurethane spinning solutions which yield spandex fibers of improved elasticity are prepared by reacting an excess of an organic diisocyanate with a hydroxyl terminated polyester prepared by reacting adipic acid with an excess of a mixture of 1,4-butylene glycol and 1,2-propylene glycol wherein the glycols are present in a mole ratio of between 80:20 and 95:5, and then chain extending the resulting prepolymer with a diamine.

3,577,389
CHAR RESISTANT POLYURETHANE
George A. Kuhar, Greensburg, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,756
Int. Cl. C08g 22/06, 22/12
U.S. Cl. 260—75 5 Claims

A polyurethane composition prepared by reacting o-tolidine diisocyanate, dicumyl peroxide and an unsaturated polyester diol of the structure obtained by the condensation of adipic acid and a mixture of ethylene glycol and glycerol α-allyl ether where the said composition has a Shore A hardness of from about 25 to about 45 and an arc image char rate of from about 1.5 to about 3 mils/second.

3,577,390
ORGANOSILICON-AMINO COMPOUNDS AS CATALYSTS IN POLYURETHANE PRODUCTION
William J. Owen, Penarth, Glamorgan, and Norman C. Lloyd, Cardiff, Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, Berkshire, England
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,710
Claims priority, application Great Britain, Sept. 27, 1967, 44,033/67
Int. Cl. C08g 22/36, 22/38, 22/44
U.S. Cl. 260—77.5 5 Claims

Organosilicon amino compounds are employed as curing catalysts in the production of polyurethanes. The novel catalysts are defined by the formula

$$R_aR'_bN[QSiR''_3]_{3-a-b}$$

where R is hydrogen or certain organic radicals, R′ and R″ are certain organic radicals, Q is methylene, ethylene or propylene and *a* and *b* are 0 or 1.

3,577,391
ALCOHOL-BLOCKER ISOCYANATE COMPOSITIONS AND DERIVATIVES
Perry A. Argabright, Brian L. Phillips, and Vernon J. Sinkey, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio
No Drawing. Original application Mar. 4, 1966, Ser. No. 531,772. Divided and this application Oct. 8, 1968, Ser. No. 798,506
Int. Cl. C08g 22/32
U.S. Cl. 260—77.5 11 Claims

Urethane-containing compositions, particularly baked on coatings, are produced by the reaction of organic polyhalides with metal cyanates in the presence of monohydric alcohol and aprotic solvent.

3,577,392
WORKABLE POLYAMIDES BY BLENDING WITH INORGANIC THIOCYANATES
Rajindar K. Kochhar and Bert H. Clampitt, Overland Park, and Ronald E. Gilbert, Shawnee Mission, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Oct. 31, 1968, Ser. No. 772,396
Int. Cl. C08g 20/38
U.S. Cl. 260—78 3 Claims

Polyamides can be tailored to have more workable properties by blending with a minor portion of an inorganic thiocyanate such as sodium or potassium thiocyanate. With the exception of ammonium thiocyanate, which has the opposite effect on melt viscosity, the blends raise melt viscosity, and lower the normal freezing point. Individual physical properties of the extruded or molded polyamide blend remain the same or are improved, except with ammonium thiocyanate which reduces tensile strength and elongation.

3,577,393

ETHYLENE-PROPYLENE-DIENE TERPOLYMER RUBBERS AND PROCESSES THEREFOR

Albert Schrage, East Orange, and Jules Ernest Schoenberg, Bergenfield, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of application Ser. No. 695,468, Jan. 3, 1968. This application Aug. 20, 1968, Ser. No. 753,995

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.78 7 Claims

Substantially gel-free novel sulphur-curable elastomers prepared by reacting ethylene, an alpha-olefin (preferably propylene) and the cross-dimer of cyclopentadiene and methylcyclopentadiene.

3,577,394

2-CHLOROETHYL 2-CYANOACRYLATE AND COMPOSITIONS THEREOF

Joseph K. Harrington, Edina, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Sept. 27, 1968, Ser. No. 763,378

Int. Cl. C08f *3/74*

U.S. Cl. 260—78.4 3 Claims

A useful cyanoacrylate monomer, 2-chloroethyl 2-cyanoacrylate, is provided, having utility in adhesive compositions. A process for its preparation is described.

3,577,395

NOVEL CATALYST FOR THE POLYMERIZATION OF CONJUGATED DIENES

Joginder Lal and Morford C. Throckmorton, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Apr. 9, 1969, Ser. No. 814,831

Int. Cl. C08d *3/06*

U.S. Cl. 260—82.1 10 Claims

There is disclosed a process of the polymerization of butadiene and butadiene in mixture with other conjugated diolefins to form polymers containing a high portion of butadiene units in the cis 1,4 configuration comprising contacting at least one diolefin with a catalyst comprising (A) at least one compound selected from the group consisting of organometallic compounds wherein the metal is selected from Groups I, II and III of the Periodic Table and hydrides of metals of Groups II and III of the Periodic Table and their monomeric or polymeric halide derivatives, amine derivatives and complexes of these hydrides with amines, ethers or other molecules capable of forming complex compounds with these hydrides, (B) at least one organonickel compound and (C) at least one organic fluoro-chemical compound.

3,577,396

POLYMERIZATION OF CONJUGATED DIENES BY MEANS OF A NICKEL FLUOROBORATE HYDRATE/ORGANOMETALLIC COMPOUND CATALYST SYSTEM

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed June 30, 1969, Ser. No. 837,906

Int. Cl. C08d *3/06*

U.S. Cl. 260—82.1 7 Claims

There is disclosed a process for the polymerization of butadiene and butadiene in mixture with other conjugated diolefins to form polymers containing a high portion of the butadiene units in the cis-1,4 configuration comprising contacting at least one diolefin under polymerization conditions with a binary catalyst system comprising (A) at least one nickel fluoroborate hydrate containing from 15% to 31% by weight of water of hydration and (B) at least one organometallic compound wherein the metal is selected from Groups I, II and III of the Periodic Table.

3,577,397

PROCESS AND PRODUCT FROM TREATING LIVE ELASTOMERS WITH PHOSPHAZENES

Adel F. Halasa, Bath, Ohio, and Russell W. Koch, Blacksburg, Va., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 711,927, Mar. 11, 1968. This application Nov. 24, 1969, Ser. No. 879,596

Int. Cl. C08d *5/04*; C08f *27/08*

U.S. Cl. 260—85.1 13 Claims

The process described herein involves a method of converting relatively low molecular weight elastomers prepared by alkali metal-catalyzed polymerizations, such as alkyllithium catalyst polymerizations, and still containing active lithium or other alkali metal therein, by post-reaction with phosphazenes, which can be represented as $(PNCl_2)_x$ wherein x is 3 or 4. The postreacted products are highly branched elastomers having a broad molecular weight distribution and possessing less cold flow than the polymers from which they are produced. Surprisingly, even though the molecular weight of the polymer is increased many times, the reaction product displays little or no cold flow even after extension with oil.

3,577,398

SYNTHETIC RESIN

Henry A. Pace and Victor J. Anhorn, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 556,293, June 9, 1966. This application Sept. 12, 1969, Ser. No. 857,598

Int. Cl. C08d *3/04*

U.S. Cl. 260—85.3 1 Claim

A polymeric resinous composition comprising from about 40 to about 80 weight percent units derived from piperylene and from about 60 to about 20 weight percent units derived from 2-methyl-2-butene wherein the said resinous composition has a softening point of from about 80° C. to about 110° C. The said polymeric resinous composition can be modified by having up to about 25 weight percent units derived from certain other unsaturated hydrocarbons. The polymeric resinous composition is prepared by polymerizing a mixture comprising from about 20 to about 75 weight percent of piperylene and from about 80 to about 25 weight percent of 2-methyl-2-butene in the presence of an anhydrous metal halide selected from aluminum chloride and stannic chloride.

3,577,399

ETHYLENE INTERPOLYMERS

George A. Mortimer, La Marque, Tex., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 23, 1968, Ser. No. 761,837

Int. Cl. C08f *15/04*

U.S. Cl. 260—88.1 4 Claims

Compositions of matter comprised of interpolymers of ethylene and from 1 to 10 mole percent of a monovinyl silane and a method for their preparation.

3,577,400

NOVEL CATALYSTS FOR THE POLYMERIZATION OF ALICYCLIC OLEFINS

William Allen Judy, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Aug. 26, 1968, Ser. No. 755,376

Int. Cl. C08f *15/04*

U.S. Cl. 260—88.2 13 Claims

A method for the ring opening polymerization of unsaturated alicyclic compounds containing at least 4 and not more than 5 carbon atoms and one double bond in

the cyclic ring and unsaturated alicyclic compounds containing at least 8 carbon atoms and at least one double bond in the cyclic ring is disclosed which comprises subjecting such unsaturated alicyclic compounds to a catalyst system comprising (A) a tungsten or molybdenum halide or oxyhalide and (B) at least one Lewis acid of the formula $M—X_n$ where M is a metal represented by aluminum, zinc, gallium, tin and antimony; X is a halogen such as bromine, chlorine, iodine and fluorine and *n* is an integer equal to the valence of M.

3,577,401

POLYMERIZATION OF VINYL CHLORIDE USING AN IN-SITU INITIATOR AND A BASIC CALCIUM COMPOUND AS A BUFFER

Edwin Studley Smith, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Feb. 17, 1969, Ser. No. 799,953
Int. Cl. C08f *1/11, 1/60, 3/30*
U.S. Cl. 260—92.8 **5 Claims**

Process for making polyvinyl chloride having improved resistance to "plate out" using a basic calcium compound as a buffer in combination with a peroxydicarbonate initiator formed in-situ.

3,577,402

PASTE ROSIN SIZE CONTAINING VISCOSITY DEPRESSANT

Robert Alan Dorbransky, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed July 24, 1968, Ser. No. 747,132
Int. Cl. C08h *11/00*
U.S. Cl. 260—97 **2 Claims**

Paste rosin size at 150°–200° F. containing 0.5%–5% of a water-soluble alkanepolyol which has a molecular weight below 250 and a boiling point above 150° C. possesses low viscosity and decreased tendency to develop a hard, brittle, foamy crust when exposed to the air in that temperature range.

3,577,403

1,1-BIS-[4-(1'-BENZYL-3'-METHYL-PYRAZALONE-AZO)PHENYL]CYCLOHEXANE

Hans Raab and Günter Hagelloch, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 12, 1967, Ser. No. 689,786
Claims priority, application Germany, Dec. 17, 1966, F 50,995
Int. Cl. C09b *31/14;* C09d *11/16, 11/18*
U.S. Cl. 260—160 **1 Claim**

A water-insoluble diazo dyestuff particularly advantageous in the dyeing of inks and pastes for ball point pens is produced by coupling 1-benzyl-3-methyl-pyrazolone with 1,1-bis-(4-aminophenyl)cyclohexane.

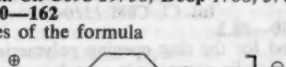
3,577,404

BASIC PYRAZOLONE MONOAZO DYES CONTAINING AN AMMONIUM OR HYDRAZINIUM GROUP

Roland Entschel, Basel, Curt Mueller, Binningen, Basel-Land, and Willy Steinemann, Basel, Switzerland, assignors to Sandoz Ltd., also known as Sandoz A.G., Basel, Switzerland

No Drawing. Filed July 23, 1968, Ser. No. 746,758
Claims priority, application Switzerland, Aug. 11, 1967, 11,369/67; July 15, 1968, 10,552/68
Int. Cl. C09b *29/38;* D06p *1/06, 3/04*
U.S. Cl. 260—162 **12 Claims**

Basic dyes of the formula



wherein

K_1 stands for a coupling compound of the pyrazolone series,

y stands for an alkylene or arylene radical,

Z stands for —O—, —S— or $—SO_2—$,

$K^{\oplus}$ stands for a hydrazinium- or an ammonium group

and wherein the ring B may bear further substituents; are useful for dyeing acrylonitrile polymers and copolymers. Resulting dyeings have good fastness properties.

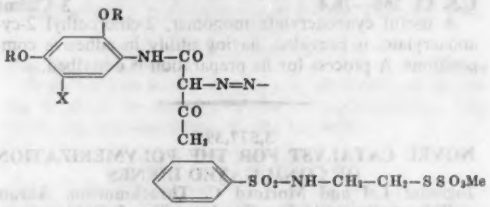
3,577,405

WATER-SOLUBLE, YELLOW MONO-AZO DYES WITH ACTIVE METHYLENE COUPLER

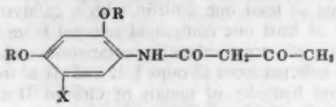
Hermann Hoffmann, East Greenwich, and Helmut Schmidt, Warwick, R.I., assignors to American Hoechst Corporation, New York, N.Y.

No Drawing. Filed May 8, 1968, Ser. No. 727,715
Int. Cl. C07c *107/04;* C09b *29/32*
U.S. Cl. 260—193 **8 Claims**

Azo dyes of the formula



in which R stands for methyl or ethyl, X stands for hydrogen or chlorine, and Me represents an alkali metal or ammonium, are prepared by combining diazotized 2-(4'-amino-benzenesulfonylamino)-ethyl-thiosulfuric acid with a coupling component of the formula



in which R stands for methyl or ethyl and X stands for hydrogen or chlorine, at a temperature between 0° C. and 20° C. and a pH between 2 and 6, which azo dyes are readily soluble in water and have good to excellent fastness when applied to native or regenerated cellulose, cellulose acetate, wool, silk, leather and synthetic materials such as polyester and especially polyamide fibers.

3,577,406

PROCESS FOR PREPARING THE ANTIBIOTIC STREPTOZOTOCIN

Edward J. Hessler, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed May 23, 1968, Ser. No. 731,615
Int. Cl. C07c *95/04*
U.S. Cl. 260—211 **6 Claims**

A chemical process for preparing the antibiotic streptozotocin starting with D-glucosamine which is reacted with N-methylisocyanate to produce N-(methylcarbamcyl)-D-glucosamine, and then reacting this latter compound with a nitrosating agent to produce streptozotocin. Streptozotocin is disclosed in U.S. Patent 3,027,300 as useful for veterinary purposes because of its high activity against *Pasteurella multocida* and *Salmonella pullorum*.

3,577,407

HIGHLY HYDROXYPROPYLATED GRANULE POTATO STARCH

Erling I. Hjermstad, Cedar Rapids, Iowa, assignor to Penick & Ford, Limited, Cedar Rapids, Iowa

No Drawing. Filed May 19, 1969, Ser. No. 826,027
Int. Cl. C08b *19/06*
U.S. Cl. 260—233.3 3 Claims

A process for the production of hydroxypropylstarch in the water-washable granule form even after reaction to a high degree of substitution (up to 20–30% hydroxypropyl content) by treating potato starch granules at elevated temperatures in water suspesion of near-neutral pH for at least one hour followed by alkaline catalyzed hydroxypropylation.

3,577,408

TETRAHYDRO-2-OXOFURAN PENICILLINS

Harvey E. Alburn, West Chester, William Dvonch, Radnor, and Stephan Sallay, Wynnewood, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Oct. 15, 1968, Ser. No. 767,822
Int. Cl. C01d *99/16*
U.S. Cl. 260—239.1 3 Claims

6-(tetrahydro - 2 - oxofuran - 3 - carboxamido) penicillanic acids which may be substituted in the 3 and 5 positions, or the opened ring forms of these penicillins are produced, having antibiotic activity.

ERRATUM

For Class 260—239.3 see:
Patent No. 3,577,557

3,577,409

2-RCH_2NH-4-X-5-SULFAMYLBENZOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Dec. 7, 1965, Ser. No. 512,217
Int. Cl. C07d *7/04, 15/04, 15/12*
U.S. Cl. 260—239.6 6 Claims

4-chloro or bromo-5-sulfamyl-N-substituted-anthranilic acid diuretic compounds, having as N-substituents a saturated pyranylmethyl, a dioxolanylmethyl, or a dioxanylmethyl group are described. These products are prepared by the reaction of 2,4-dihalo-5-sulfamylbenzoic acid and RCH_2NH_2 where R is a tetrahydropyranyl, a dioxolanyl or a dioxanyl group.

3,577,410

13β-ALKYL-17-HYDROXYGONA-4,14-DIEN-3-ONES

Daniel M. Teller, King of Prussia, George H. Douglas, Paoli, and Herchel Smith, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed July 30, 1968, Ser. No. 749,922
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 25 Claims

New steroids of the 13β-alkyl-17β-hydroxygona-4,14-dien-3-one series optionally substituted at C–7 and C–17 by α-methyl (I) are provided by either (a) isomerizing a corresponding 17-hydroxy-13β-alkylgona-5(10),14-dien-3-one (II) or (b) reacting with a methyl Grignard reagent a corresponding 17-hydroxy-13β-alkylgona-4,6,14-trien-3-one (III). Means are provided to prepare the intermediate compounds II and III. Compounds I and Ia are androgenically-active in warm-blooded lower animals.

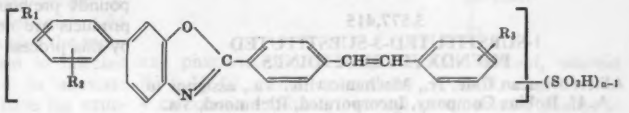
3,577,411

6-PHENYLBENZAZOLYL DERIVATIVES

Peter Liechti, Binningen, Leonardo Guglielmetti, Birsfelden, Erwin Maeder, Aesch, Basel-Land, and Adolf Emil Siegrist, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 483,355, Aug. 27, 1965. This application Oct. 9, 1967, Ser. No. 673,953
Claims priority, application Switzerland, Sept. 4, 1964, 11,401
Int. Cl. C07d *85/48*
U.S. Cl. 260—240 10 Claims

The present invention relates to new and valuable 6-phenyl-2-stilbenyl-benzoxazoles which may be represented by the formula



wherein R_1, R_2 and R_3 are identical or different and each represents a member selected from the group consisting of hydrogen, halogen, alkyl or alkoxy containing 1 to 12 carbon atoms, phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl portion, nitrile, free or neutralized carboxyl (—COO cation), carboxylic acid alkyl ester with 1 to 12 carbon atoms in the alkyl portion, carbon amide, carbon alkyl amide with 1 to 12 carbon atoms, free or neutralized sulphonic acid (—SO_2O cation) or sulphonamide, and *n* stands for the whole numbers 1 to 3.

The compounds of this invention are especially useful as optical brighteners for organic materials.

3,577,412

PROCESS FOR RECOVERING CEPHALOSPORIN C_A ANTIBIOTICS

Billy G. Jackson, 4230 Lincoln Road 46208; and John L. Spencer, 1045 W. 77th S. Drive 46260, both of Indianapolis, Ind.; and Harvey M. Higgins, Jr., R.R. 1, Box 220–A, Danville, Ind. 46227

No Drawing. Continuation-in-part of abandoned application Ser. No. 437,553, Mar. 5, 1965. This application Apr. 29, 1969, Ser. No. 820,325
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 2 Claims

Removing Cephalosporin C_A antibiotics, e.g., cephaloridine, from concentrated, inorganic salt solutions thereof as the hydrothiocyanate salt using hydrochloric or sulfuric acid.

3,577,413

PROCESS OF PREPARING TRITYLAMINES

Charles R. Adams, Oakland, Calif., and Hans J. Arpe, am Quintengarten, Hans J. Schulze-Steinen, Bad Soden, Taunus, and Jurgen F. Falbe, Wasserland, Germany, Alan C. Edwards, The Hague, Netherlands, and Hans Tetteroo, Wasserland, Germany, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Oct. 11, 1967, Ser. No. 674,637
Claims priority, application Germany, Oct. 14, 1966, P 16 20 412.9
Int. Cl. C07d *87/26*
U.S. Cl. 260—247 8 Claims

Process of preparing tritylamines by reacting a primary or secondary amine with a trityl chloride-Friedel-Crafts catalyst complex, e.g., N-tritylmorpholine is prepared by reacting morpholine with a trityl chloride-aluminum trichloride complex.

3,577,414

BERYLLIUM HYDRIDE TERTIARY AMINE COMPLEXES

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 645,560, June 5, 1967. This application Mar. 27, 1968, Ser. No. 716,669

Int. Cl. C07d *87/26, 27/04*

U.S. Cl. 260—247 6 Claims

Complexes of beryllium hydride with tertiary amines, containing one molecule of beryllium hydride for each tertiary amino nitrogen atom in the amine, are prepared by reaction of beryllium hydride with an excess of a tertiary amine in a ball or rod mill at ambient temperature and pressure.

3,577,415

1-SUBSTITUTED-3-SUBSTITUTED PHENOXYPYRROLIDINES

Albert Duncan Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,395

Int. Cl. C07d *27/04*

U.S. Cl. 260—247.2 10 Claims

1-substituted-3-substituted phenoxypyrrolidines useful as anti-depressants are disclosed. The compounds are prepared from 1-methyl-3-pyrrolidinols and 1-benzyl-3-pyrrolidinols.

3,577,416

PROCESS FOR THE SELECTIVE CHLORINATION OF ALKYLMERCAPTO-SUBSTITUTED s-TRIAZINES

Werner Schwarze, Frankfurt am Main, Günter Giesselmann, Neu-Isenburg, and Wolfgang Weigert, Offenbach am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,099

Claims priority, application Germany, Feb. 17, 1968, P 16 70 590.1

Int. Cl. C07d *55/48*

U.S. Cl. 260—248 18 Claims

s-Triazines which are 2 or 2,4 or 2,4,6 substituted by alkylmercapto groups and wherein the balance of said 2,4,6 substituents is substituted by chlorine, if any, are selectively chlorinated by subjecting the triazines to the action of a chlorinating agent, the amount of chlorinating agent in said reaction being selected to provide for at least two chlorine atoms for each alkylmercapto group to be converted, whereby a predetermined number of said alkylmercapto groups may be converted to chlorine. The products of the reaction are valuable for making herbicides, optical brighteners, light stabilizers, and other compounds and are useful also as stabilizers for polyformaldehyde and as starting products for making stabilizers for the rubber industry.

3,577,417

2,4,6-TRISUBSTITUTED-s-TRIAZINES

Margot Louise Cantrall, New City, Martin Leon Sassiver, Monsey, and Robert Gordon Shepherd, South Nyack, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 22, 1969, Ser. No. 827,048

Int. Cl. C07d *55/22*

U.S. Cl. 260—249.6 10 Claims

This disclosure describes compounds of the class of N^2 - (polycycloalkyl) - N^4,N^6-bis(aliphatic or alicyclic) melamines useful as anti-mycobacterial agents.

3,577,418

PYRAZINAMIDE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Edward J. Cragoe, Jr., Lansdale, and Kenneth L. Shepard, Ambler, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 718,976, Mar. 21, 1968, which is a continuation-in-part of application Ser. No. 666,004, Sept. 7, 1967. This appplication Feb. 12, 1969, Ser. No. 798,809

Int. Cl. C07d *51/76*

U.S. Cl. 260—250 49 Claims

A new method is disclosed for the preparation of pyrazinamide derivatives. The process involves reaction of an amine derivative with a very reactive pyrazinoyloxyacrylamide prepared by reaction between a pyrazinoic acid and an isoxazolium salt. The reactivity of the pyrazinoyloxyacrylamide permits the preparation of compounds previously unavailable and hence many of the products are new compounds. The compounds prepared by this process have utility as diuretics.

3,577,419

2,6-DISUBSTITUTED-4-(ω-AMINOALKOXY) PHENYL PYRIMIDINES

Rudolf G. Griot, Riehen, Switzerland, assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 725,197, Apr. 29, 1968. This application Oct. 24, 1969, Ser. No. 869,330

Int. Cl. C07d *51/36*

U.S. Cl. 260—256.4 12 Claims

This invention relates to 2-substituted-6-cyclosubstituted-4-[4-(ω-aminoalkoxy)phenyl]pyrimidines useful as hypolipidemics and/or as anti-convulsants, and to preparation of said compounds.

3,577,420

CERTAIN 4-AMINOFURO[2,3-d]PYRIMIDINES

Hans-Jurgen E. Hess, Groton, and Timothy H. Cronin, Niantic, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed Jan. 5, 1968, Ser. No. 695,868

Int. Cl. C07d *99/04*

U.S. Cl. 260—256.4 4 Claims

4-aminofuro[2,3-d]pyrimidines relax smooth muscle and inhibit cyclic 3′,5′-nucleotide phosphodiesterase activity. The compounds are synthesized by condensing α-haloketone or aldehyde with dimethyl malonate, reacting the ethylene ketal malonamide therewith alkanoic acid ester, cyclizing with acid to obtain the furo[2,3-d]pyrimidine-4-one, then obtaining a 4-amino derivative through the 4-chloro intermediate. The 5,6-alkylene compounds are prepared by condensing α-hydroxy cyclic ketone with malonitrile and cyclizing with alkanoic acid amide.

3,577,421

PIPERAZINE SUBSTITUTED DITHIOSEMICARBAZONES

Paul Anthony Barrett, London, England, assignors to Burroughs Wellcome Co., Triangle Park, N.C.

No Drawing. Filed May 18, 1966, Ser. No. 550,934

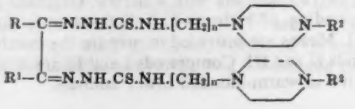
Claims priority, application Great Britain, May 25, 1965, 22,006/65

The portion of the term of the patent subsequent to Nov. 11, 1986, has been disclaimed

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 5 Claims

A compound



where R and R^1 are hydrogen, alkyl, cyclohexyl, benzyl, phenyl, halogen substituted phenyl or alkyloxyalkyl, R^2 is lower alkyl and *n* is a number from 1 to 8. The compounds are useful in the treatment of coccidiosis.

3,577,422

4-[ω-[4-(2-, OR 3-HALO-p-TOLYL) - 1-PIPERAZINYL] ALKOXY] - β,β - DIMETHYLHYDROCINNAMIC ACID ESTERS

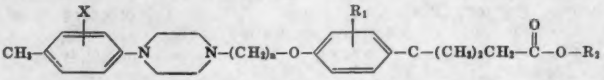
Norman E. Wideburg and Laura H. Miller, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Continuation of application Ser. No. 717,392, Mar. 29, 1968. This application Apr. 10, 1968, Ser. No. 720,348

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 **4 Claims**

Newly synthesized 4-[ω-[4-(2-, or 3-halo p-tolyl)-1-piperazinyl]alkoxy] - β,β - dimethylhydrocinnamic acid esters useful for chemotherapeutically reducing the number of flukes of genus Schistosoma present in infected warm-blooded animals have been found to alleviate symptoms of schistosomiasis. These esters have the structural formula



wherein X is a halogen; *n* is an integer of from 3 to 6; R_1 is hydrogen or lower alkoxy; and R_2 is methyl, ethyl, or a straight or branched chain alkyl radical of up to 5 carbon atoms. The esters are prepared by microbiologically oxidizing a 1-(2-, or 3-halo-p-tolyl)-4-[ω-(p-tert-pentylphenoxy) alkylene]piperazine to the corresponding hydrocinnamic acid and then esterifying the acid.

3,577,423

1,4-BIS-(3-INDOLEGLYOXYLOYL) PIPERAZINES AND DERIVATIVES THEREOF

John L. Archibald, Malvern, and Meier E. Freed, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Dec. 3, 1965, Ser. No. 511,362, now Patent No. 3,471,499, dated Oct. 7, 1969. Divided and this application June 26, 1969, Ser. No. 844,717

Int. Cl. C07d *57/100*

U.S. Cl. 260—268 **14 Claims**

The compounds are 1,4-bis-(3-indoleglyoxyloyl)piperazines. Said compounds are useful as intermediates in the preparation of corresponding 1,4-bis(2-indol-3-ylethyl)piperazines and their salts, which are pharmacologically active as hypotensives.

3,577,424

4-PHENYL-8-AMINO TETRAHYDROISOQUINOLINES

Gustav Ehrhart, Bad Soden, Taunus, Karl Schmitt, Frankfurt am Main, Irmgard Hoffmann, Bad Soden, Taunus, and Heinrich Ott, Eppstein, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of application Ser. No. 635,398, May 2, 1969. This application Oct. 20, 1969, Ser. No. 867,932

Claims priority, application Germany, May 5, 1966, F 49,122; Aug. 12, 1966, F 49,122; Apr. 15, 1967, F 52,134, F 52,135

Int. Cl. C07d *35/38*

U.S. Cl. 260—287 **9 Claims**

4-phenyl-8-amino tetrahydroisoquinolines having centrally stimulating and thymoleptic action. Methods for their manufacture by ring closure, acylation, or reduction. Pharmaceutical compositions containing these compounds.

3,577,425

8-(1,4-BENZODIOXAN-2-YLMETHYL)-3-OXO-1-THIA-4,8-DIAZASPIRO[4.5]DECANES

Michio Nakanishi, Oita, Katsuo Arimura, Fukuoka, Hiroshi Imamura, Chiba, and Toshihiro Kobayakawa, Fukuoka, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

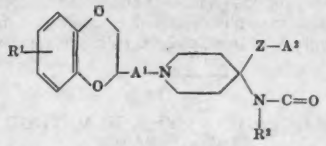
No Drawing. Filed Dec. 10, 1968, Ser. No. 782,752

Claims priority, application Japan, Dec. 11, 1967, 42/79,638; Dec. 13, 1967, 42/80,743

Int. Cl. C07d *29/34*

U.S. Cl. 260—293.4 **19 Claims**

Benzodioxane derivatives of the formula



and pharmaceutically acceptable salts thereof, wherein R^1 is H, Cl, methyl or methoxy, R^2 is H, alkyl of 1 to 4 carbon atoms, benzyl, phenyl or substituted phenyl in which the substituent is selected from the group consisting of Cl, methyl methoxy and trifluoromethyl, A^1 is $—CH_2—$, $—CH_2CH_2—$, —CO— or $—CH_2CO—$ the carbonyl portion of which is bound to the N atom of the piperidine ring or $—CH(OH)—CH_2—$ the methylene ($—CH_2—$) portion of which is bound to the N atom of the piperidine ring, A^2 is $—CH_2—$, or $=CHCH_3$, and Z is —S—, —SO— or $—SO_2—$, are vasodilators of low toxicity in mammals.

3,577,426

4-(4-TETRAHYDROPYRANYL)PYRIDINES

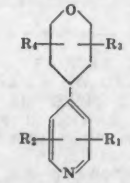
Charles K. McGill and George W. Campbell, Jr., Indianapolis, Ind., assignors to Reilly Tar & Chemical Corporation, Indianapolis, Ind.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,714

Int. Cl. C07d *31/30*

U.S. Cl. 260—297 **10 Claims**

4-(tetrahydropyranyl)pyridines having the formula:



in which R_1 and R_2 represent hydrogen or lower alkyl; R_3 and R_4 represent hydrogen, lower alkyl, or phenyl; they may be alike or they may be different. In general the tetrahydropyranylpyridines are made by the dehydration of a pyridyl pentanediol.

3,577,427

BROMINATION OF 2,1,3-BENZOTHIADIAZOLES AND BENZOFURAZANS

Kurt H. Pilgram, Modesto, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,768

Int. Cl. C07d *85/48, 91/44*

U.S. Cl. 260—304 **5 Claims**

Aqueous hydrobromic acid or nitric acid is used as the reaction medium for bromination of 2,1,3-benzothiadiazoles and benzofurazans.

3,577,428
2-AMINO-4-ARYLOXYALKYL-4-ALKYL-2-OXAZOLINES
John T. Suh, Mequon, and Joseph A. Skorcz, Milwaukee, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,078
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 5 Claims

Compounds are 2-amino-4-aryloxyalkyl-4-alkyl-2-oxazolines which are useful as central nervous system stimulants and antihypertensive agents. The compounds may also be used as intermediates in the preparation of pickling agents, mothproofing agents and wood preservatives. Among the compounds disclosed is 2-amino-4-methyl-4-(o-methoxyphenoxy)methyl-2-oxazoline hexamate.

3,577,429
PHTHALOCYANINE DYE AND METHOD FOR MAKING SAME
Thomas C. Crawford, 4423 Ridgevalley Drive, Charlotte, N.C. 28208
No Drawing. Filed Mar. 11, 1968, Ser. No. 711,913
Int. Cl. C09b *47/08*
U.S. Cl. 260—314.5 6 Claims

Copper tetra-(4)-sodiothiosulfatophthalocyanine dye useful for dyeing cotton and regenerated cellulose textiles green is prepared by simultaneously heating and aerating for 1–36 hours at 40° C.–90° C. and at pH 6.5–7.5 an aqueous composition comprising 1 part copper tetra-(4)-thiocyanophthalocyanine, 0.65–1.3 parts sodium bisulfite, and 0.65–1.3 parts sodium sulfite, and further characterized in that the parts of sodium sulfite and sodium bisulfite are approximately equal.

3,577,430
OXINDOLE ACETIC ACID AMIDES
Janis Plostnieks, Philadelphia, Pa., assignor to McNeil Laboratories, Inc.
No Drawing. Continuation-in-part of application Ser. No. 642,685, June 1, 1967. This application Feb. 17, 1969, Ser. No. 799,948
Int. Cl. C07d *27/40*
U.S. Cl. 260—325 14 Claims

The compounds are of the class of 2-oxindole acetamides useful as ultra-violet light absorbers and having central nervous system depressant activity; and of the class of 2-oxo-3-indoline acetate esters useful as intermediates in the preparation of said acetamides.

3,577,431
SANDWICH-TYPE CHEMICAL COMPOUNDS AND METHOD FOR THEIR PREPARATIONS
Earl Dan Flickinger, El Dorado, and Charles Merlyn Buess, Wichita, Kans., assignors to Skelly Oil Company, Tulsa, Okla.
No Drawing. Continuation-in-part of application Ser. No. 554,651, June 2, 1966. This application Feb. 19, 1968, Ser. No. 706,663
Int. Cl. C07d *27/28*
U.S. Cl. 260—326.1 5 Claims

New compositions of matter having two ring nuclei composed of 6 carbon atoms essentially superimposed in fixed parallel planes with respect to each other and process of preparing the same.

3,577,432
1-SUBSTITUTED-3-PHENOXYPYRROLIDINES
Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.
No Drawing. Filed Dec. 23, 1968, Ser. No. 786,383
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.3 15 Claims

1-substituted-3-phenoxypyrrolidines useful as muscle relaxants, anti-convulsants and major tranquilizers are disclosed. The compounds are prepared from 3-phenoxypyrrolidines.

3,577,433
KETO-ENOL NITROGEN-CONTAINING HETEROCYCLES HAVING AN AMINO SUBSTITUENT
Robert Fuks, Ixelles, Brussels, and Heinz G. Viehe, Beersel, Linkebeek, Belgium, assignors to Union Carbide Corporation
No Drawing. Filed Aug. 8, 1967, Ser. No. 659,013
Int. Cl. C07d *27/16*
U.S. Cl. 260—326.5 9 Claims

There is disclosed a new class of nitrogen-containing heterocyclic compounds. The new compounds have a nitrogen hetero atom in a five- or six-membered ring (the ring can be fused to one or more other rings), an amino substituent on the ring carbon alpha to the hetero nitrogen, and an oxygen (either carbonyl or hydroxyl) bonded to the ring carbon gamma to the hetero nitrogen. The new compounds are exemplified by 3-hydroxy-5-amino-pyrrolenines and 4-hydroxy-2-amino-quinolines (or the ketone tautomers thereof). The new compounds are produced by reacting an alpha- or a beta-aminoester with an N,N-disubstituted-1-amino-1-alkyne or an N,N,N′,N′-tetrasubstituted-1,1-diamino-1-alkene. This process for producing the new compounds is also novel. The compounds are useful as hydrogen halide acceptors and catalysts.

3,577,434
N-ARYL-α-(HYDROXYMETHYLENEIMINO)-α′-OXO-CYCLOPOLYMETHYLENEAMINE AND RELATED COMPOUNDS AND A METHOD FOR THEIR PREPARATION
Stanley C. Bell, Penn Valley, and Peter H. L. Wei, Upper Darby, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed June 10, 1968, Ser. No. 735,524
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 10 Claims

The disclosure is directed to N-aryl-α-(hydroxymethyleneimino)-α′-oxocyclopolymethyleneamines, N-aryl-α-(methyleneimino)-β-alkanoyl-α′-oxocyclopolymethyleneamines, their substituents, and a method for their preparation. The compounds have central nervous system activity as depressants. That is, they produce a calming effect in the host.

3,577,435
PROCESS FOR THE PREPARATION OF 3-ARYL-2-IMINO-3-INDOLINOLS AND RELATED COMPOUNDS
Stanley C. Bell, Narberth, and Carl Gochman, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 694,066, Dec. 28, 1967. This application Aug. 14, 1968, Ser. No. 752,488
Int. Cl. C07d *27/38*
U.S. Cl. 260—326.11 9 Claims

A new process is disclosed reacting a 2-benzoyl acylanilide with ionic cyanides to form new 3-aryl-2-imino-3-indolinols and 2-amino-3-aryl-3H-indol-3-ols. These products may be further reacted to form a number of new derivatives which have pharmacological activity as central nervous system depressants.

ERRATUM

For Class 260—328 see:
Patent No. 3,577,558

3,577,436
2-SUBSTITUTED-CYCLOPENTA[β] THIANAPHTHENE-3-ONES
John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 599,698, Dec. 7, 1966. This application Nov. 25, 1969, Ser. No. 879,904
Int. Cl. A61k *27/00*; C07d *63/22*
U.S. Cl. 260—330.5 6 Claims

The compounds are 2-substituted-cyclopenta[β]thianaphthene-3-ones useful as tranquilizing agents. A compound disclosed is 1-H-2(dimethylaminomethyl)cyclopenta[β]thianaphthene-3-one.

3,577,437
EPOXY RESINS FROM ALKYLATED PHENOL NOVOLAC RESINS
John R. Le Blanc, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Jan. 6, 1969, Ser. No. 789,346
Int. Cl. C08g *5/08, 30/06*
U.S. Cl. 260—33.6 14 Claims

Improved epoxy novolac resins produced by first reacting epichlorohydrin with an alkylated phenol aldehyde novolac resin wherein said alkylate is a specific C_8 through C_{13} mixture of carbocyclic compounds, and then thereafter dehydrohalogenating the resulting product.

3,577,438
METHOD OF PRODUCING OXETANE ESTERS
Bruce Allen Melaas, Corpus Christi, Tex., assignor to Celanese Corporation
No Drawing. Original application Oct. 31, 1963, Ser. No. 320,557, now Patent No. 3,328,427, dated June 27, 1967. Divided and this application Mar. 13, 1967, Ser. No. 635,936
Int. Cl. C07d *3/00*
U.S. Cl. 260—333 1 Claim

Disclosed herein are methods for producing bicyclic ortho esters and their isomers, oxetane esters. Bicyclic ortho esters are prepared by direct esterification of trimethylolalkanes with certain monocarboxylic acids. The bicyclic ortho ester can be converted to the oxetane isomer by heating at a temperature of from 275° C. to 525° C. in the presence of an alumina isomerization catalyst.

3,577,439
3-(1,8-DIMETHOXY-4-METHYL-2-NAPHTHYL)-4,6-DIALKOXY-5-SUBSTITUTED PHTHALIDES
Jerry Robert Daniel McCormick, Spring Valley, and Nancy Hazlett Arnold, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Aug. 19, 1969, Ser. No. 851,463
Int. Cl. C07d *5/38*
U.S. Cl. 260—343.3 10 Claims

This disclosure describes 3-(1,8-dimethoxy-4-methyl-2-naphthyl-4,6-dialkoxy-5-substituted phthalides useful as intermediates for the preparation of 6-methyl-1,3,10,11,12-pentahydroxynaphthacene-2-carboxamide.

3,577,440
1-SUBSTITUTED-3-AMIDO-PYRROLIDINES
Carl Dalton Lunsford and Grover Cleveland Helsley, Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.
No Drawing. Continuation-in-part of abandoned application Ser. No. 786,420, Dec. 23, 1968. This application Nov. 7, 1969, Ser. No. 874,986
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.3 15 Claims

1-substituted-3-amidopyrrolidines useful as analgetics and anti-depressants are disclosed. The compounds are prepared by acylation of 1-substituted-3-aminopyrrolidines.

3,577,441
NITRO SUBSTITUTED BENZOFURANS
Daniel Kaminsky, East Paterson, Robert I. Meltzer, Rockaway, and John Shavel, Jr., Mendham, N.J., assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.
No Drawing. Filed Mar. 7, 1967, Ser. No. 621,156
Int. Cl. C07d *5/42, 5/44*
U.S. Cl. 260—346.2 3 Claims

A novel method for the production of substituted benzofurans by reacting an activated halo compound with an oxime in the presence of a suitable base to obtain an oxime ether. The oxime ether is then treated to yield the benzofuran nucleus.

3,577,442
1-(DICARBOXYPHENYL)-INDANE DICARBOXYLIC ACID DIANHYDRIDE
Howard V. Holler, Oakland, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 776,000
Int. Cl. C07c *63/48, 63/02*
U.S. Cl. 260—346.3 2 Claims

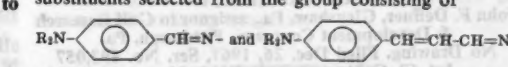
The novel compounds 1-(3',4'-dicarboxyphenyl)-1,3,3-trimethyl-5,6 and 6,7-indane dicarboxylic dianhydrides, useful as curing agents for epoxy resins, are prepared by the dehydration of the corresponding novel tetracarboxylic acids. The acids are formed by oxidation of the isomeric dimers of 1,2-dimethyl-4-isopropenylbenzene.

3,577,443
SEPARATION OF OLEFINS FROM EPOXIDES
Thomas A. Washall, Wilmington, Del., and Sidney Blittman, Philadelphia, Pa., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,149
Int. Cl. C07d *1/12*
U.S. Cl. 260—348 9 Claims

C_6–C_{18} olefins are separated from C_6–C_{18} epoxides in mixtures wherein the boiling range of the epoxides overlaps the boiling range of the olefins utilizing a cyclic silica gel adsorption process.

3,577,444
SUBSTITUTED ANTHRAQUINONES
Nicholas J. Clecak, San Jose, and Robert J. Cox, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
No Drawing. Filed Jan. 8, 1969, Ser. No. 789,928
Int. Cl. C07c *119/10*
U.S. Cl. 260—378 3 Claims

Anthraquinones having at the 2 and the 6 positions substituents selected from the group consisting of



wherein R is lower alkyl. The compounds are useful as dichroic photoconductors and as photosensitizers for photoconductive polymers such as polyvinylcarbazole.

3,577,445
19-NORSTEROIDAL 3-CHLORO-3,5-DIENES
Donald W. Oliver, West Chester, and Gerhard R. Wendt, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed Dec. 23, 1968, Ser. No. 786,374
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 1 Claim

Novel 19-norsteroidal 3-chloro-3,5-dienes, particularly, 3-chloro-13-ethyl-17α-ethynyl (or chloroethynyl)gona-3,5-dien-17-ols (I) are provided by chloro/enolizing the corresponding gon-4-en-3-ones (II) with a reagent such as oxalyl chloride. Compounds I are pharmacologically active as bronchodilators and biocidally-active, as bacteri-cides.

3,577,446

PHOSPHATIDYLALKANOLAMINE DERIVATIVES

Sumanas Rakhit, Dollard des Ormeaux, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Sept. 9, 1968, Ser. No. 758,587
Int. Cl. A23j 7/00
U.S. Cl. 260—403 1 Claim

There are disclosed herein phosphatidylalkanolamines in which the alkanolamine is 2-hydroxyethyl-, 2- or 3-hydroxypropyl-, or 3-hydroxybutylamine and the acyl groups contain from 18–20 carbon atoms and three or more double bonds. The compounds have anti-hypertensive properties, and methods for their preparation and use are also disclosed.

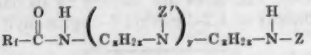
3,577,447

ALKANOYL DERIVATIVES OF FLUORINATED AMIDES

Richard F. Sweeney, Randolph Township, and Alson K. Price, Morris Township, Morris County, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Aug. 1, 1968, Ser. No. 749,316
Int. Cl. C09f 7/00
U.S. Cl. 260—404.5 18 Claims

Alkanoyl derivatives of fluorinated amides useful as oil-repellency agents have the structural formula



wherein x and y are integers from 2 to 6 and 1 to 4, respectively; wherein R_f is a perfluoroalkyl or a fluorinated isoalkoxyalkyl radical; Z is H, alkyl, hydroxyalkyl, a fluorinated acyl radical R_fCO— wherein R_f is as described above, or a hydrocarbon acyl radical; Z' is H, alkyl, hydroxyalkyl, a fluoroinated acyl radical R_fCO— wherein R_f is as described above, a hydrocarbon acyl radical or a radical of the formula $—C_xH_{2x}NHZ$ wherein x and Z are as described above, there being at least one fluorinated acyl radical R_fCO— and at least one hydrocarbon acyl radical in the molecule represented by Z and/or Z'.

ERRATUM

For Class 260—410.6 see:
Patent No. 3,577,559

3,577,448

BIS(CYCLOPENTADIENYL) COMPOUNDS OF VANADIUM

John F. Deffner, Glenshaw, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,057
Int. Cl. C07j 9/00; C08g 7/04; C06d 5/00
U.S. Cl. 260—429 14 Claims

β - Diketonatobis(cyclopentadienyl)vanadium nitrates and perchlorates and β-diketonatobis (C_1–C_4 alkylcyclopentadienyl)vanadium nitrates and perchlorates are disclosed as new compounds useful in modifying the polymerization of an olefin such as styrene. Examples show that polymerization of styrene is accelerated by acetylacetonatobis(cyclopentadienyl)vanadium nitrate; acetylacetonatobis(methylcyclopentadienyl)vanadium perchlorate; 6-methyl - 2,4 - heptanedionatobis(methylcyclopentadienyl) vanadium nitrate; and 1,3-diphenyl-1,3-propanedionatobis (cyclopentadienyl)vanadium perchlorate. Polymerization of styrene is inhibited by 3,5-heptanedionatobis(cyclopentadienyl)vanadium perchlorate.

3,577,449

PROCESS FOR THE PREPARATION OF A COMBUSTION ADDITIVE

Charles I. Ashmore, Manassas, Va., assignor to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Jan. 7, 1969, Ser. No. 789,623
Int. Cl. C07j 15/02
U.S. Cl. 260—439 2 Claims

A process for the preparation of 1,3-diferrocenyl-1-butene which comprises the mixing and reacting under the application of heat 1-ferrocenylethanol with acetic acid.

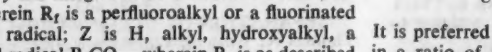
3,577,450

PROCESS FOR PREPARING METHYLENE BIS-(ALUMINUM DIHALIDES)

Morris R. Ort, Seabrook, Tex., and Edward H. Mottus, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,449
Int. Cl. C07f 5/06
U.S. Cl. 260—448 3 Claims

Aluminum, a methylene dihalide and the corresponding halogen are reacted to form a methylene bis-(aluminum dihalide) and there may be some by-product formed, which will contain an aluminum atom having only a single halogen atom attached. For example, when chlorine, methylene dichloride and aluminum are reacted, the following compounds are formed:



It is preferred that the halogen and aluminum be reacted in a ratio of about 1:1 on a gram-atom basis for optimum yields of the bis-aluminum compound, and it is preferred to use high purity aluminum, that all reactants be substantially moisture-free and the reaction be carried out in an inert atmosphere. It is preferred to carry the reaction out in the dark to inhibit the halogenation of the methylene dihalide, especially chlorination.

3,577,451

SULFAMIDE DERIVATIVES

Engelbert Kühle, Bergisch-Gladbach, Erich Klauke, Cologne-Flittard, Paul-Ernst Frohberger, Burscheid, Bezirk, Dusseldorf, and Hans Scheinpflug, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 20, 1967, Ser. No. 610,500
Claims priority, application Germany, Feb. 17, 1966, F 48,451
Int. Cl. C07c 143/00
U.S. Cl. 260—453 7 Claims

The disclosure covers broadly N,N'-di(alkyl and/or alkenyl) - [N - mono(fluorodichloromethylmercapto) or N,N' - di(fluorodichloromethylmercapto)] - sulfamides which possess fungicidal properties and which may be prepared by conventional procedures.

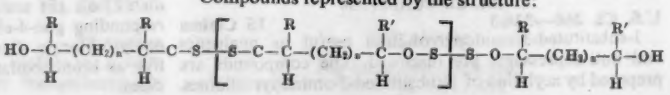
3,577,452

ORGANIC ESTERS OF BIVALENT SULFUR

Quentin E. Thompson, Belleville, Ill., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Dec. 28, 1964, Ser. No. 421,672, now Patent No. 3,357,993, dated Dec. 12, 1967. Divided and this application Aug. 10, 1967, Ser. No. 668,734
Int. Cl. C07c 145/00
U.S. Cl. 260—456 5 Claims

Compounds represented by the structure:



where y is an integer from 0 to 10, R and R' are each selected from the group consisting of hydrogen, alkyl radicals having from 1 to 16 carbon atoms, cycloalkyl radicals having from 5 to 6 carbon atoms, cycloalkylalkyl radicals having from 7 to 17 carbon atoms, alkenyl radicals having from 2 to 16 carbon atoms, providing that the total of the number of carbon atoms of R and R' is not greater than 20, and aryl radicals and n is an integer from 0 to 16 and a method for preparing said compounds.

3,577,453

TRIFLUOROMETHYL PHENYL-N-(HALOPHENYL)-CARBAMATES AND PESTICIDAL PREPARATIONS CONTAINING SAME

Otto Rohr, Therwil, and Hans Rudolf Hitz, Muttenz, Switzerland, assignors to Ciba Limited, Basel, Switzerland

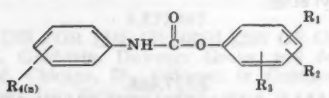
No Drawing. Continuation-in-part of application Ser. No. 351,234, Mar. 11, 1964. This application June 16, 1967, Ser. No. 646,449

Claims priority, application Switzerland, Mar. 15, 1963, 3,294/63

Int. Cl. C07c *125/06;* **A01n** *9/20*

U.S. Cl. 260—471 **3 Claims**

Compounds are provided of the formula



wherein R_1 represents hydrogen or halogen, alkyl with 1 to 4 carbon atoms, $—NO_2$, $—CF_3$ or —CN; R_2 represents hydrogen or halogen; R_3 represents alkyl containing 1 to 4 carbon atoms, $—NO_2$, $—CF_3$ or —CN, and R_4 represents halogen and $n=1$ or 2. The compounds of this invention are especially useful as pesticides for controlling bacteria and fungi.

3,577,454

PROCESS FOR CRYSTALLIZING BIS(β·HYDROXYETHYL)TEREPHTHALATE

Max H. Keck, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed July 1, 1968, Ser. No. 741,312

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 **4 Claims**

A process for purifying bis(β-hydroxyethyl)terephthalate by crystallization in which crystal modifying agents are added to solutions of the ester to induce formation of crystals of a size and shape that permits their recovery from the solution in pure state.

3,577,455

t-BUTYL-α-METHYL-γ-NITRO VALERATE

Robert E. Jones, North Muskegon, Mich., and Harold Reynolds, Kankakee, Ill., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Feb. 10, 1966, Ser. No. 526,369

Int. Cl. C07c *69/24, 69/66, 103/08*

U.S. Cl. 260—478 **1 Claim**

t-Butyl-α-methyl-γ-nitro valerate useful as an intermediate in the preparation of a levulinic acid derivative which is useful in the preparation of non-steroidal anti-inflammatory agents.

3,577,456

PROCESS FOR THE MANUFACTURE OF AQUEOUS ALKALI PARAFFIN SULPHONATE SOLUTIONS CONTAINING SMALL AMOUNTS OF ALKALI SULFATE

Hans-Jerg Kleiner, Bad Soden, Taunus, and Karl Rehn, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 16, 1968, Ser. No. 705,904

Int. Cl. C07c *143/02, 139/14;* **B01f** *17/02*

U.S. Cl. 260—513 **6 Claims**

An aqueous solution of alkali paraffin sulphonates having a low content of alkali sulphate is obtained from sulphoxidation products by separating the main part of the hydrotropically dissolved paraffin by addition of a low molecular alcohol, neutralizing the aqueous-alcoholic solution with an alkali and separating the precipitated alkali sulphate.

3,577,457

PROCESS FOR PREPARING 4,4'-DICARBOXYBENZOPHENONE

Johann G. D. Schulz, Pittsburgh, Pa., assignor to Gulf Research and Development Company, Pittsburgh, Pa.

No Drawing. Filed July 19, 1968, Ser. No. 745,962

Int. Cl. C07c *65/20*

U.S. Cl. 260—517 **13 Claims**

A process for preparing purified 4,4'-dicarboxybenzophenone which invloves treating a mixture containing 4,4'-dicarboxybenzophenone and impurities with methanol or ethylene glycol at a temperature below about 85° C., whereby the 4,4'-dicarboxybenzophenone remains unaffected but the impurities are removed.

3,577,458

PROCESS FOR THE PREPARATION OF ISOCYANATES

Arthur M. Brownstein, Morristown, and John P. Sibilla, Livingston, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application Nov. 14, 1966, Ser. No. 593,668, now Patent No. 3,465,024, dated Sept. 2, 1969. Divided and this application Feb. 3, 1969, Ser. No. 828,024

Int. Cl. C07c *119/00*

U.S. Cl. 260—545 **3 Claims**

This invention is directed to the diacetate ester of certain dihydroxamic acids; said acetate esters can be decomposed to form isocyanates.

3,577,459

N-ALKYL AND N,N-DIALKYL ALKANESULFONAMIDE BIS(ALKYLIMINES) AND N-ALKYL AND N,N-DIALKYL ALKYLIMINES AND PROCESSES FOR PREPARING SAME

Robert G. Laughlin, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 20, 1968, Ser. No. 730,637

Int. Cl. C01c *145/00*

U.S. Cl. 260—551 **17 Claims**

Novel N-alkyl and N,N-dialkyl alkanesulfonamide bis-(alkylimine) and N-alkyl and N,N-dialkyl alkanesulfonamide alkylimine compounds and novel processes for their preparation. These compounds have utility as extreme pressure lubricant additives, as anti-microbial agents and as accelerators in the synthesis of rubber.

3,577,460

SYNTHESIS OF PERFLUOROISOPROPYLIDENIMINE

Robert A. Falk, Rockaway, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed Nov. 7, 1968, Ser. No. 774,161
Int. Cl. C07c 119/00
U.S. Cl. 260—566 6 Claims

The compound perfluoroisopropylidenimine,

$$(CF_3)_2C{=}NF$$

is prepared by a novel method comprising treating

$$(CF_3)_2CFI$$

with N_2F_4 to form $(CF_3)_2CFNF_2$ and defluorinating the latter product with ferrocene to form $(CF_3)_2C{=}NF$. The compound $(CF_3)_2C{=}NF$ is useful as a monomer, which form copolymers with tetrafluoroethylene useful in preparing extruded and molded plastic bodies.

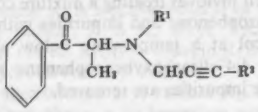
3,577,461

α-PROPARGYLAMINO-PROPIO-PHENONES AND THE SALTS THEREOF

Edward John Warawa, 2575 N. 37th St., and John Hans Biel (522 Green Bay Road, Lake Bluff, Ill.), both of Milwaukee, Wis. 53210

No Drawing. Filed Oct. 10, 1968, Ser. No. 766,626
Int. Cl. C07c 97/10
U.S. Cl. 260—570.5 9 Claims

α-Propargylaminopropiophenone derivatives of the formula



wherein R^1 is (lower)alkyl, (lower)alkenyl, (lower) alkynyl, benzyl, cyclopropyl or cyclopropylmethyl and R^2 is hydrogen, (lower)alkyl, phenyl or benzyl; and the pharmaceutically acceptable nontoxic salts thereof exhibit central nervous system stimulant activity and anorexic activity and are useful as central nervous system stimulants and to inhibit appetite in mammals.

3,577,462

N-ARYLALKYL-β-HYDROXY-β-PHENYL-ETHYLAMINES AND THE SALTS THEREOF

William F. Bruce, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 502,370, Oct. 22, 1965. This application Aug. 8, 1968, Ser. No. 751,028
Int. Cl. C07c 91/22
U.S. Cl. 260—570.6 6 Claims

Diaralkylamines are prepared by prolonged reaction of styrene oxide with dialkylaminoalkyl, hydroxyalkyl, halobenzyl, and heteroalkyl amines. The compounds show central nervous system depressant activity.

3,577,463

SYNTHESIS OF STEROIDS

Patrick A. Diassi, Westfield, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Application June 11, 1968, Ser. No. 736,028, now Patent No. 3,449,378, dated June 10, 1969, which is a continuation-in-part of application Ser. No. 370,114, May 25, 1964. Divided and this application Jan. 16, 1969, Ser. No. 791,794
Int. Cl. C07c 49/00
U.S. Cl. 260—586 3 Claims

This invention relates to and has as its object the provision of new physiologically active steroids, processes for their production and novel intermediates useful in the preparation thereof.

3,577,464

POLYENE COMPOUNDS AS COLORING AGENTS

Hugo Gutmann, Reinach, Ulrich Manz, Basel, and Ulrich Schwieter, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Jan. 11, 1967, Ser. No. 608,487
Claims priority, application Switzerland, Jan. 21, 1966, 856/66
Int. Cl. C07c 45/00
U.S. Cl. 260—601 4 Claims

Conjugated polyene dialdehyde compounds having 14–44 carbon atoms and mixtures thereof which are useful as coloring agents for foodstuffs, pharmaceutical preparations and cosmetic preparations and a method for preparing these dialdehydes including various intermediates in this method. This method is carried out by reacting a phosphonium salt of a conjugated aliphatic olefine having a terminal aldehyde radical with a conjugated aliphatic olefine having a terminal acetal linkage radical and terminal aldehyde radical and thereafter hydrolyzing the reaction product to produce the dialdehyde. This dialdehyde may be further chain lengthened by reacting this dialdehyde with a phosphonium salt of a conjugated olefine having a terminal aldehyde radical, or by reacting with a vinyl ether or propenyl ether.

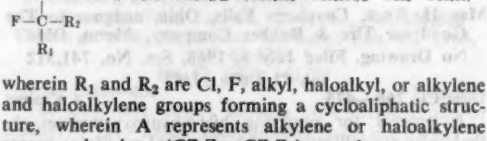
3,577,465

TERMINALLY UNSATURATED FLUOROOLEFINS

Louis Gene Anello, Basking Ridge, and Richard Francis Sweeney, Dover, N.J., and Morton Herbert Litt, University Heights, Cleveland, Ohio, assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 633,359, Apr. 25, 1967. This application Apr. 12, 1968, Ser. No. 721,113
Int. Cl. C07c 43/00
U.S. Cl. 260—614 5 Claims

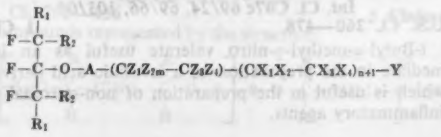
Terminally unsaturated polyfluoroolefinic compounds of the formula



wherein R_1 and R_2 are Cl, F, alkyl, haloalkyl, or alkylene and haloalkylene groups forming a cycloaliphatic structure, wherein A represents alkylene or haloalkylene groups, wherein $—(CZ_1Z_2—CZ_3Z_4)—$ and

$$—(CX_1X_2—CX_3X_4)—$$

wherein Z_1–Z_4 may be selected from H, F, Cl and perhalomethyl groups, wherein Z_3 and Z_4 may additionally be selected from haloalkyl groups and aralkyl groups and alkyl or haloalkyl which may be interrupted with ether linkages; and X_1–X_7 may be selected from H, F and Cl groups; are bifunctional groups derived from certain telomerizable unsaturated compounds, wherein m and n are integers of from 0 to 75, and wherein $—CX_5{=}CX_6X_7$ is derived from bifunctional group $—(CX_1X_2—CX_3X_4)—$ are prepared from polyfluorohalides of the formula



wherein Y is H or a halogen and R_1, R_2, A, Z_1–Z_4, X_1–X_4, *m* and *n* are as defined above by methods such as dehydrohalogenation or dehalogenation of the terminal

$$—(CX_1X_2—CX_3X_4)—Y$$

group. These terminally unsaturated fluoro-olefinic compounds are useful as intermediates for the preparation of fluorocarbon acids of art recognized utility.

3,577,466
PRODUCTION OF ALLYLIC ETHERS
Kenzie Nozaki, El Cerrito, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed July 30, 1968, Ser. No. 748,652
Int. Cl. C07c *43/14*
U.S. Cl. 260—614 **9 Claims**

Production of allylic ethers by reacting in high conversion an allylic alcohol of the formula

$$R—CH=CH—CHR'—OH$$

where R is hydrogen, methyl or hydroxymethyl and R' is hydrogen or methyl, with itself or with a nonallylic alcohol in the presence as catalyst of cupric chloride or bromide or additionally in the presence as catalyst promoter of an acidic material or an allylic halide, where the halide is chloride or bromide.

3,577,467
PROCESS FOR THE HYDROLYSIS OF LIGNIN
Irving S. Goldstein, Downers Grove, and Joseph D. Benigni, Chicago, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
No Drawing. Filed May 29, 1968, Ser. No. 732,836
Int. Cl. C07c *37/28*
U.S. Cl. 260—627 **5 Claims**

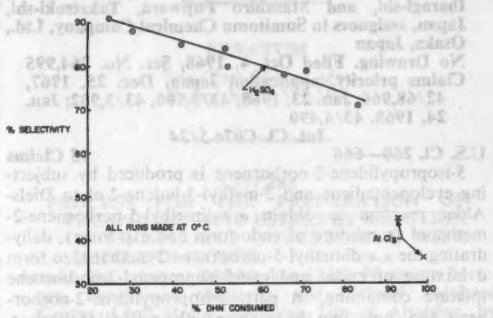
High yields of low molecular weight phenolic substances are obtained by heating, at 250° to 380° C. for 3 to 45 minutes, a slurry of water and a lignin material separated from the liquor resulting from the alkaline pulping of lignocellulose, and then recovering the phenolic materials from the reaction mixture.

3,577,468
MONOHALOGENATION OF ALKYL-ADAMANTANE HYDROCARBONS
Abraham Schneider, Overbrook Hills, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Mar. 26, 1968, Ser. No. 715,958
Int. Cl. C07c *17/10*
U.S. Cl. 260—648 **18 Claims**

C_{11}–C_{20} alkyladamantane hydrocarbons are monochlorinated, monobrominated or monofluorinated at an unsubstituted bridgehead position by reacting the same at —30° C. to 10° C. with a C_4–C_5 tertiary alkyl chloride, bromide or fluoride, using as catalyst 90–100% sulfuric acid or 90–100% hydrofluoric acid. The corresponding 1-haloalkyladamantane is obtained with little if any other reaction products.

3,577,469
PREPARATION OF 9-HALODECAHYDRO-NAPHTHALENE
Abraham Schneider, Overbrook Hills, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
Filed May 2, 1968, Ser. No. 726,132
Int. Cl. C07c *7/10, 23/36*
U.S. Cl. 260—648 **15 Claims**

Cis-decahydronaphthalene is converted to trans-9-chlorodecahydronaphthalene, or to the corresponding bromine or fluorine analogue, in a highly selective reaction with C_4–C_5 tertiary alkyl chloride, bromide or fluoride. The reaction is effected by contacting a mixture of the



reactants with 90–100% H_2SO_4 at —20° C. to 25° C., preferably at —10° C. to 10° C.

3,577,470
PROCESS FOR PREPARING 1,3,5-HALOXYLENE
John D. Bacha, Monroeville, and Charles M. Selwitz, Pitcairn, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Dec. 20, 1968, Ser. No. 785,798
Int. Cl. C07c *25/04*
U.S. Cl. 260—650 **4 Claims**

A process for isomerizing a haloxylene to a 1,3,5-haloxylene which involves contacting such haloxylene charge with hydrogen fluoride and boron trifluoride, preferably in the presence of ortho-halotoluene.

3,577,471
HALOGEN INTERCHANGE PROCESS
John G. McNulty and William L. Walsh, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Feb. 1, 1968, Ser. No. 702,214
Int. Cl. C07c *21/02*
U.S. Cl. 260—656 **5 Claims**

Halides can be made to undergo transhalogenation in a process wherein two compounds containing different halogen substituents are contacted at elevated temperatures. By this process, organic halides, such as vinyl bromide and dibromoethane, can be directly converted to vinyl chloride by contact with a suitable halide such as hydrogen chloride. Ethylene, which is easily brominated, can thus readily be converted to vinyl chloride.

3,577,472
METHOD FOR CHLORINATING PARAFFINS
John C. Jubin, Jr., Wallingford, and Matthew L. Becker, Philadelphia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.
No Drawing. Filed May 28, 1968, Ser. No. 732,507
Int. Cl. C07c *17/10*
U.S. Cl. 260—660 **7 Claims**

Paraffins are chlorinated to avoid production of dark colored impurities and to maintain maximum selectivity for the production of monochloroparaffins by admixing the chlorine with a portion of the cold paraffin charge and thereafter combining this cold chlorine-containing stream with the remainder of the charge paraffin which has been heated to a temperature above the desired reaction initiation temperature.

3,577,473

METHOD FOR PRODUCING 5-ISOPROPYLIDENE-2-NORBORNENE

Tsuneyuki Nagase, Gohu Suzukamo, Fujio Masuko, and Yukio Yoneyoshi, Takatsuki-shi, Masami Fukao, Ibaragi-shi, and Masahiro Fujiwara, Takatsuki-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Oct. 4, 1968, Ser. No. 764,995
Claims priority, application Japan, Dec. 25, 1967, 42/68,966; Jan. 23, 1968, 43/3,900, 43/3,902; Jan. 24, 1968, 43/4,490
Int. Cl. C07c *5/24*
U.S. Cl. 260—666 15 Claims

5-isopropylidene-2-norbornene is produced by subjecting cyclopentadiene and 2-methyl-3-butene-2-ol to Diels-Alder reaction to obtain α,α-dimethyl-5-norbornene-2-methanol (a mixture of endo-form and exo-form), dehydrating the α,α-dimethyl-5-norbornene-2-methanol to form a mixture of endo- and exo-5-isopropenyl-2-norbornene mixture containing, in part, 5-isopropylidene-2-norbornene, and contacting the mixture with an alkaline catalyst.

The 5-isopropylidene-2-norbornene is useful as a termonomer of a so-called ethylene-propylene terpolymer rubber, and the incorporation thereof results in a terpolymer having excellent curing characteristics.

3,577,474

CONVERSION OF C_5—C_7 CYCLOALKANES TO BENZENE AND TOLUENE

Robert L. Jacobson, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 18, 1968, Ser. No. 776,533
Int. Cl. C07c *15/04*
U.S. Cl. 260—668 7 Claims

High conversion of C_6–C_7 cycloalkanes to aromatics is obtained by contacting the cycloalkanes in the presence of hydrogen with a catalyst comprising 0.01 to 3 weight percent platinum and 0.01 to 5 weight percent rhenium in association with a porous inorganic oxide carrier and maintaining the conversion conditions sufficiently severe to convert at least 85 percent, and preferably 90 percent, of the cycloalkanes to aromatics and alkanes.

3,577,475

ISOMERIZATION OF C_8 ALKYL AROMATICS

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Jan. 30, 1969, Ser. No. 795,359
Int. Cl. C07c *5/24, 15/08*
U.S. Cl. 260—668 6 Claims

C_8 alkyl aromatic hydrocarbons are isomerized under isomerization conditions and in the presence of hydrogen with a catalyst comprising a porous solid carrier containing from 0.01 to 3 weight percent of a platinum group component and from 0.01 to 5 weight percent of a rhenium component.

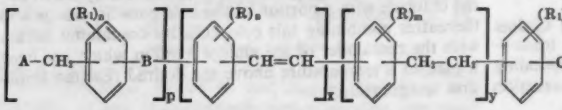
3,577,476

ARYLENE AND ARLIDENE POLYMERS AND COPOLYMERS

John A. Gurney, Tarrytown, N.Y., and Luther A. R. Hall, Woodcliff Lake, N.J., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 529,214, Feb. 23, 1966. This application Feb. 18, 1969, Ser. No. 800,269
Int. Cl. C07c *15/02*
U.S. Cl. 260—668 15 Claims

The compounds are of the class of aromatic polymeric and copolymeric compounds of the formula:



The polymeric and copolymeric compounds relate also to hydrocarbons wherein R, R_1, *n*, *m*, *x*, *y*, B, *p*, and A are as defined below. These compounds are useful as color pigments for paints, fibers and motor oil, and as color pH-indicators. They are prepared by treating dihalomethyl benzene derivatives with (a) a tertiary amine and alkaline agent; or (b) an alkali metal amide in the presence of liquid ammonia; or (c) a tertiary amine and gaseous iodine. Illustrative embodiments are poly(trimethylmesitylidene) and poly(radialene).

3,577,477

PROCESS FOR CONVERTING SATURATED HYDROCARBONS TO UNSATURATED HYDROCARBONS BY OXIDATION

Pierre Boutry, Port Marly, Jean Claude Daumas, Marly-le-Roi, and Roger Montarnal, Mareil Marly, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, Hauts-de-Seine, France

No Drawing. Filed Jan. 3, 1969, Ser. No. 788,923
Claims priority, application France, Jan. 10, 1968, 135,566
Int. Cl. C07c *11/22, 5/18, 3/28*
U.S. Cl. 260—683.3 15 Claims

A process for oxidizing saturated hydrocarbons to olefins and/or dienes, without the substantial formation of oxygen-containing by-products, due to the control of the amount of oxygen used during the oxidation reaction and the selection of particular conditions for manufacturing the catalyst.

3,577,478

GRAFT POLYMER OF A VINYL MONOMER AND A POLYESTER, AND A BUTADIENE POLYMER

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 544,817, Apr. 25, 1966. This application Nov. 12, 1968, Ser. No. 775,161
Int. Cl. C08f *43/08*; C08g *39/10*
U.S. Cl. 260—862 39 Claims

Graft copolymers are produced by reacting a polymerizable monomer with a polyester of a polycarboxylic compound and a polyhydric alcohol, wherein the polyester comprises a maximum of 5 mole percent of carboxylic and hydric components which contains aliphatic carbon-to-carbon unsaturation. Halogen-containing polyesters and phosphorus-containing polyesters are particularly useful in producing fire-retardant graft copolymers. The graft copolymers can be blended with a polymer of butadiene, such as a graft copolymer of a polymerizable monomer and polybutadiene to produce additional products. The polymer products are suitable for producing molded articles, laminates, extruded products, protective coatings, and the like, which have superior toughness, high-impact strength, fire resistance and chemical resistance.

3,577,479

ALUMINUM HALIDE ISOMERIZATION OF SATURATED HYDROCARBONS

Donald E. Jost, Media, Edward J. Janoski, Havertown, and Abraham Schneider, Philadelphia, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Aug. 9, 1968, Ser. No. 751,360
Int. Cl. C07c *5/28*
U.S. Cl. 260—683.75 8 Claims

In the isomerization of C_4–C_7 paraffins with an aluminum halide catalyst in the presence of an inert halogenated hydrocarbon solvent, it has been found that the rate

of isomerization and percentage yield is significantly increased when the solvent is present in amounts of from 10–50 volume percent based on the volume of the hydrocarbon feedstuff, and when, further, the aluminum halide catalyst is present in amounts in excess of what would be soluble in the solvent and paraffin feedstuff at the temperature employed.

3,577,480

GRAFT POLYMER OF A VINYL MONOMER AND A FIRE RETARDANT POLYESTER

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 544,816, Apr. 25, 1966. This application Nov. 12, 1968, Ser. No. 775,160

Int. Cl. C08f *21/00;* C09k *3/28*

U.S. Cl. 260—869 **34 Claims**

Graft copolymers are produced by reacting a polymerizable monomer with a polyester of a polycarboxylic compound and a polyhydric alcohol, wherein the polyester comprises a maximum of 5 mole percent of carboxylic and hydric components which contains aliphatic carbon-to-carbon unsaturation. Halogen-containing polyesters and phosphorus-containing polyesters are particularly useful in producing fire-retardant graft copolymers. The graft copolymers can be blended with a polymer of butadiene, such as a graft copolymer of a polymerizable monomer and polybutadiene to produce additional useful products. The polymer products are suitable for producing molded articles, laminates, extruded products, protective coatings, and the like, which have superior toughness, high-impact strength, fire resistance and chemical resistance.

3,577,481

PHOSPHORIC ACID ESTERS

Max Schuler, Arlesheim, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

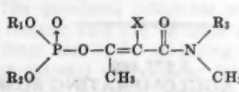
No Drawing. Continuation-in-part of application Ser. No. 715,138, Mar. 22, 1968. This application Nov. 12, 1969, Ser. No. 876,102

Claims priority, application Switzerland, Apr. 3, 1967, 4,689/67

Int. A01n *9/36;* C07f *9/08*

U.S. Cl. 260—942 **10 Claims**

Compounds of the Formula I



(I)

wherein

each of R_1 and R_2 represents a methyl or ethyl radical,
each of R_3 and R_4 represents an alkyl radical with 1 to 4 carbon atoms, and
X represents a hydrogen or halogen atom,

are exemplified and their use as pest combating agents in plant cultivation is given; specific pesticidal effects tested are those against *Bruchidius obtectus, Ephestia* (*Anagesta*) *kuehniella, Aphis fabae* and *Tetranychus telarius* as well as toxicity comparison studies on rats.

3,577,482

PROCESS FOR THE PREPARATION OF THIONOPHOSPHONATES

Delbert L. Hanna, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed May 31, 1968, Ser. No. 733,331

Int. Cl. C07f *9/40*

U.S. Cl. 260—973 **5 Claims**

A process for preparing an O-alkyl-O-phenyl phenylthionophosphonate which comprises

(a) reacting a phenylthionophosphonoyl dihalide with an alkanol in the presence of trimethylamine and,

(b) reacting the resulting intermediate reaction mixture with a phenol in the presence of trimethylamine, and thereafter recovering the desired product.

ERRATUM

For Class 264—8 see:
Patent No. 3,577,560

3,577,483

PROCESS FOR THE PREPARATION OF PHOSPHORIC ACID ESTERS BY REACTION OF PHOSPHORUS OXYCHLORIDE WITH ALKYLENE OXIDES

Arnold Kotzschmar, Burgkirchen (Alz), Hermann Metzger, Burghausen (Salzach), and Richard Reinhard Gustav Adolf Rothe, deceased, late of Altotting, by Rudolfine Rothe, nee Roessler, heiress, Altotting, and Willy Seidel, Burgkirchen (Alz), Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Aug. 9, 1967, Ser. No. 659,533

Claims priority, application Germany, Aug. 13, 1966, F 49,943, Patent 1,290,532

Int. Cl. C07f *9/08;* C08f *45/58*

U.S. Cl. 260—977 **5 Claims**

Process for the continuous preparation of phosphoric acid esters having utility as plasticizers and for imparting flame resistant properties by reaction of phosphorus oxychloride with alkylene oxides, in which a large amount of the final product is used as reaction medium. The products produced according to the process of the present invention are superior to the discontinuously prepared esters because they have an extraordinarily low acid value.

3,577,484

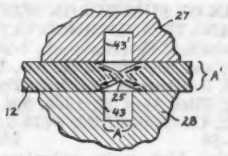
METHOD FOR FORMING LINES OF WEAKNESS IN THERMOPLASTIC

William P. Jacobson, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Feb. 27, 1969, Ser. No. 802,781

Int. Cl. B29c *25/00;* B29d *7/22*

U.S. Cl. 264—92 **9 Claims**



A line of weakness is formed in a sheet of thermoplastic which has been heated to render it soft and flowable by the disclosed method of cooling the surface of the heated sheet but not at the desired line of weakness and shrinking the sheet away from said line to reduce the thickness thereat. The line of weakness may be a fold line or a tear line, both of which are utilized in the disclosed carton. A carton blank is formed by apparatus which includes opposed heating heads, opposed forming heads and a trimming station. The forming heads have grooves in their surfaces at the desired location of the lines of weakness. Mechanisms are provided for cooling the forming heads and for drawing a vacuum on the grooves.

3,577,485

METHOD FOR PREPARATION OF CARBONITRIDE NUCLEAR FUEL MATERIALS

Ronald L. Beatty, Oak Ridge, James M. Leitnaker, Kingston, and Karl J. Notz, Jr., Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Feb. 3, 1969, Ser. No. 796,175
Int. Cl. G21c *21/00*
U.S. Cl. 264—.5 7 Claims

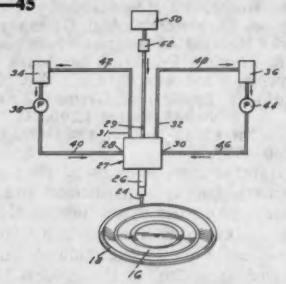
A rapid method for converting actinide oxide-carbon particles to actinide carbonitride is given and comprises contacting the actinide oxide-carbon particles with nitrogen in a fluidized bed furnace at elevated temperatures.

3,577,486

METHOD OF FORMING AN AIR CLEANER SEAL

Joseph B. Sebok, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 20, 1968, Ser. No. 761,226
Int. Cl. B29d *27/02, 27/04*
U.S. Cl. 264—45 6 Claims



Liquid curable to elastic polyvinylchloride, polybutadiene or polyurethane is dispensed into a groove near the periphery of an air cleaner cover while the cover is rotating at about one revolution per second through a finite number of revolutions. A subsequent application of heat simultaneously cures the liquid and bonds the resulting seal to the cover.

ERRATUM

For Class 264—53 see:
Patent No. 3,577,360

3,577,487

PREPARATION OF SUBMICRON SIZED ALKALINE EARTH TITANATE AND ZIRCONATE POWDERS

Moises Gali Sanchez, Severna Park, Newton Levy, Jr., Ellicott City, and Richard R. Rettew, Laurel, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 22, 1968, Ser. No. 731,306
Int. Cl. C04b *33/32;* F27b *9/04*
U.S. Cl. 264—56 4 Claims

Highly reactive, high purity, submicron sized alkaline earth titanates and zirconates are prepared by first blending hydroxides, nitrates, etc. and hydrogels and then passing the resulting product through a fluid energy mill.

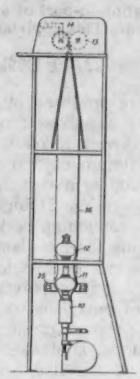
3,577,488

MANUFACTURE OF PLASTIC TUBULAR FILM

Bernard K. Bigland, Radcliffe, Manchester, England, assignor to General Engineering Company (Radcliffe) Limited

Continuation-in-part of application Ser. No. 557,581, June 14, 1966. This application July 15, 1969, Ser. No. 841,871
Claims priority, application Great Britain, June 15, 1965, 25,190/65
Int. Cl. B29d *7/24*
U.S. Cl. 264—95 6 Claims

A method of forming an extruded tube of plastic material comprising extruding the material in a semi-molten state as a tubular film, having a wall of greater thickness than that of the finished tube, locating a first former within the tube near the extrusion point, passing the film over the face of the former in close proximity thereto, locating a second former at a point more remote from the extrusion point, passing the film over the face of the second former in close proximity thereto, directing a high velocity stream of air against the inner face of the film from below the first former and creating a further high velocity stream of air against the inner face of the film and between it and the second former, extracting air from the space between the two formers to maintain the air pressure in said space between the formers at or below atmospheric pressure, said streams of air moving at a velocity sufficient to prevent actual contact between the film and the formers, and arranging that the freeze zone of the film is in the region of maximum diameter of the second former and preferably between the position of maximum diameter and the downstream end thereof. The diameter of the tube being extruded can be varied by varying the diameter of the second former. In order to obtain still greater speeds of extrusion external cooling can be applied.



3,577,489

METHOD FOR AGGLOMERATING SUSPENDED PARTICLES

Christian Rosenthal, Munich, Germany, assignor to Chemische Werke Munich Otto Barlocher G.m.b.H., Munich, Germany

No Drawing. Continuation-in-part of application Ser. No. 649,088, June 26, 1967. This application Apr. 26, 1968, Ser. No. 725,271
Claims priority, application Germany, June 28, 1966, C 39,466; July 1, 1966, C 39,506; Sept. 16, 1966, C 40,148; Mar. 9, 1967, C 41,719; Apr. 28, 1967, C 42,182
Int. Cl. B01j *2/10*
U.S. Cl. 264—117 13 Claims

A plurality of finely subdivided solid particles is converted into a mass of distinct agglomerated bodies by suspending the solid subdivided particles in water heated to at least 80° C. The particles must be such that water is inert thereto and which are at most slightly soluble in water. The granulating agent is a synthetic organic plastic which is dissolved in a liquid organic solvent at at least 80° C. The granulating solution is then added to the suspension and the thus-formed mixture is maintained, preferably under stirring, at an elevated temperature below 100° C. and sufficiently high to form granules of the finely subdivided particles and the granulating agent so

that a plurality of agglomerated bodies each comprising a plurality of the finely subdivided particles adhered to each other by the granulating agent will be obtained.

3,577,490

EFFERVESCENT TABLET AND PROCESS FOR MAKING SAME

Thomas Laurence Welsh, Donald Leroy Peterson, Blasey Thomas Palermo, and George Carr Hoss, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Original application Oct. 10, 1967, Ser. No. 671,948, now Patent No. 3,518,343, dated June 30, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,923

Int. Cl. A61j *3/10;* A61k *7/16*

U.S. Cl. 264—120 **9 Claims**

An effervescent tablet is produced by preparing a powdered tabletable composition comprising an effervescent couple, an antimicrobial substance, a tableting lubricant, and preferably, a flavoring, sweetening and/or coloring agent, mixing the same to achieve uniformity, and compressing into coherent tablet form. The lubricant can be fumaric acid or particles of a liquid lubricant coated with an oil-insoluble film-forming substance. Upon dissolution, a solution having antimicrobial properties is produced. The solution is useful for cleaning solid surfaces, particularly, the teeth and periodontal gum areas of the oral cavity.

3,577,491

TABLETING

Peter Henry Cox, Oss, Netherlands, assignor to Miles Laboratories Incorporated, Elkhart, Ind.

No Drawing. Original application Jan. 2, 1968, Ser. No. 694,890, now Patent No. 3,518,346, dated June 30, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,924

Int. Cl. A61j *3/10;* A61k *7/16*

U.S. Cl. 264—120 **7 Claims**

An improvement in the process of compressing powdered tabletable compositions is gained by mixing fumaric acid with said composition prior to compression. The fumaric acid acts as a surface lubricant and as an internal compression lubricant for said tabletable compositions. The powdered tabletable compositions lubricated with fumaric acid can be those intended for internal employment such as for alkalizing of the stomach or intended for external use such as for general cleaning of solid surfaces.

3,577,492

TABLETING LUBRICANT

Thomas Laurence Welsh and George Ronald Tomaich, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Original application Oct. 2, 1967, Ser. No. 672,004, now Patent No. 3,518,344, dated June 30, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,944

Int. Cl. A61j *3/10;* A61k *7/16*

U.S. Cl. 264—120 **6 Claim**

An improvement in the process of compressing powdered tabletable materials is gained by mixing with said materials prior to tableting, a lubricant comprising, in combination, a siloxane polymer and dry-mixable particles of a lubricating oil coated with an oil-insoluble film-forming substance. The lubricant acts as both a punch face lubricant and as a diewall lubricant for said tabletable materials. The powdered tabletable materials lubricated with the above lubricant can be those intended for general cleaning of solid surfaces or those intended for therapeutic employments.

3,577,493

METHOD OF FABRICATING A GLASS FABRIC LAMINATE MATERIAL

Henry J. Lee, Cherry Hill, N.J., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 30, 1968, Ser. No. 772,012

Int. Cl. B29g *1/00, 5/00*

U.S. Cl. 264—137 **2 Claims**

The present invention relates to a novel and improved method of synthesizing a polyurethane polymer which has outstanding chemical and mechanical properties and which is particularly useful as an adhesive resin in a glass cloth reinforced laminate material. The improved process utilizes the ability of aromatic polyisocyanates to dimerize and trimerize and react with a short chain aliphatic glycol under carfully controlled conditions of heat to form a unique prepolymer that is subsequently cured at a specified temperature.

3,577,494

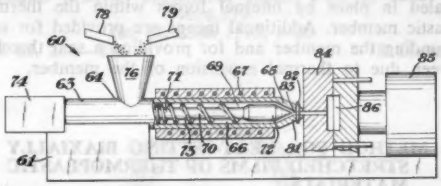
METHOD FOR THE PREPARATION OF EXTRUDABLE SYNTHETIC RESINOUS MATERIALS

Douglas S. Chisholm and James K. Rieke, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 796,937, Oct. 31, 1968, which is a continuation-in-part of application Ser. No. 677,440, Oct. 23, 1967. This application Sept. 5, 1969, Ser. No. 857,298

Int. Cl. B28b *3/22*

U.S. Cl. 264—143 **10 Claims**



Improved feed of granular synthetic resinous material in screw extruders is obtained and fiber breakage is significantly reduced when chopped glass fiber and extrudable resin are mixed in an extruder having an increasing working volume screw. The product has significantly improved impact strength.

3,577,495

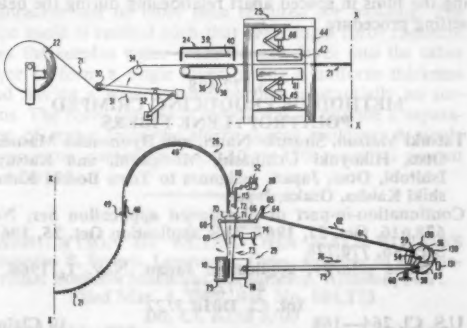
EGG CARTON FORMING METHOD

David L. Pearl, 55 Enterprise Blvd. SW., Atlanta, Ga. 30336; Beverly P. Head, Jr., 3528 Victoria Road, Birmingham, Ala. 35223; and John G. Waller, 1429 E. Cambridge Ave., College Park, Ga. 30337

Filed July 28, 1969, Ser. No. 845,462

Int. Cl. B26d *1/56;* B29c *17/10*

U.S. Cl. 264—153 **7 Claims**



An egg carton forming method wherein a sheet of polystyrene is passed through a predetermined path where the

sheet is heated at a first station. A plurality of egg carton impressions each complete with egg tray, lid and locking flap are formed across the width of the sheet at a second station. Latching holes are punched in the lid impressions at a third station, and the egg carton impressions are cut away from the sheet of material at a fourth station.

3,577,496

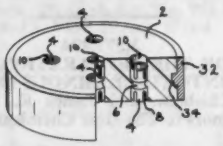
METHOD OF MAKING A SEALED ELECTRICAL CONNECTING DEVICE

Norman Edwin Hoffman, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Original application Sept. 23, 1965, Ser. No. 489,697, now Patent No. 3,409,864, dated Nov. 5, 1968. Divided and this application Mar. 21, 1968, Ser. No. 714,829

Int. Cl. B29c *27/16, 27/20*

U.S. Cl. 264—156 **1 Claim**



A sealed assembly is provided and comprises a member formed of thermoplastic material having memory characteristics. An opening extends through the member for receiving an electrical contact, which contact is sealed in place by internal forces within the thermoplastic member. Additional means are provided for surrounding the member and for providing a seal therebetween due to thermal expansion of the member.

3,577,497

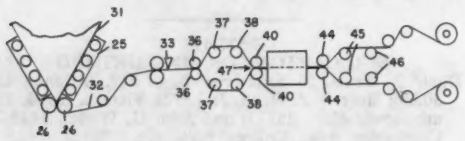
METHOD FOR HEAT-SETTING BIAXIALLY STRETCHED FILMS OF THERMOPLASTIC MATERIALS

Tomoyuki Matsugu, Ryota Notomi, and Teruchika Kanoh, Shizuoka-ken, Japan, assignors to Kohjin Company Limited, Tokyo, Japan

Filed Apr. 28, 1969, Ser. No. 819,549

Int. Cl. B29c *25/00*

U.S. Cl. 264—159 **6 Claims**



Simultaneously heat-setting of a pair of flat, biaxially oriented films formed of thermoplastic material. Maintaining the films in spaced apart relationship during the heat-setting procedure.

3,577,498

METHOD OF PRODUCING CRIMPED POLYPROPYLENE FIBERS

Tatsuki Matsuo, Shosuke Nanri, and Ryunosuke Masuda, Otsu, Hikoyuki Uchihashi, Moriguchi, and Katsuya Ishitobi, Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

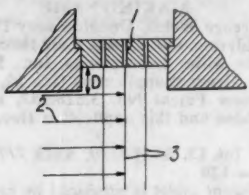
Continuation-in-part of abandoned application Ser. No. 678,616, Oct. 27, 1967. This application Oct. 25, 1968, Ser. No. 770,776

Claims priority, application Japan, Nov. 1, 1966, 41/72,222

Int. Cl. D01d *5/22*

U.S. Cl. 264—168 **10 Claims**

Bulky crimped polypropylene fibers, the coil crimps of which have a coil diameter of e.g. less than 0.7 mm., and are of good reproducibility, are made by cooling or quenching polypropylene filament, immediately after coming out of the spinning orifice, asymmetrically in the cross-sectional direction of the filament so as to create a cross-sectional anisotropy in the filament structure, and then stretching the filament and heat treating the same in a relaxed state. Use is made of a spinnerette in which the



minimum distance between the orifices is more than 4.0 mm. Cooling is effected by cooling gas under particular conditions of velocity and distance between spinnerette face and gas. The fiber is stretched 2.5 or more times its length at a particular temperature so that the fine voids are distributed asymmetrically in the cross section of the fiber.

3,577,499

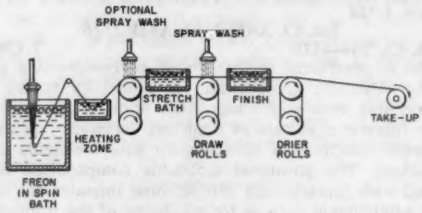
METHOD FOR PREPARING PERMANENTLY OPAQUE FIBERS

John P. Knudsen, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 5, 1967, Ser. No. 665,504

Int. Cl. D01f *7/00*

U.S. Cl. 264—182 **9 Claims**



Smooth delustered acrylic fibers having a highly porous internal microvoid structure which is permanently sealed and not collapsed by drying have been prepared by coagulation of solution spun acrylic polymers in a coagulation bath containing volatile fluorinated aliphatic compounds dissolved therein and thereafter heating the fiber.

3,577,500

PROCESS FOR THE PRODUCTION OF POLYAMIDE FIBRES HAVING HIGH LINEAR STRENGTH AND KNOT STRENGTH

Armin Kohler, Bela von Falkai, Klaus Offermann, and Alfred Reichle, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed May 22, 1969, Ser. No. 827,018

Claims priority, application Germany, June 1, 1968, P 17 60 539.9

Int. Cl. D02j *1/22*

U.S. Cl. 264—210 **2 Claims**

Process for the production of polyamide fibres having linear strength and knot strength by stretching polyamide monofils at temperatures of 25 to 35° C. below the temperature level of the crystallite melting maximum at a ratio of 1:4.5 to 1:6.5.

3,577,501

MOLD DOPE AND PROCESS OF USING

Monte H. York, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of application Ser. No. 752,428, July 2, 1968, which is a continuation of application Ser. No. 395,915, Sept. 11, 1964. This application Dec. 4, 1969, Ser. No. 878,965

Int. Cl. B29c *1/04;* B29d *27/04*

U.S. Cl. 264—213 10 Claims

This invention relates to a method of molding polyurethane foam materials utilizing an improved mold release agent comprising an alpha olefin having from 2 to about 4 carbon atoms and a melting point of about 100 to 250° F. in a carrier and containing .3 to about 5 parts per 100 of a substituted phenylene diamine as an antioxidant.

3,577,502

PROCESS FOR ANNEALING SUBSTANTIALLY UNSTRETCHED POLYLACTONE ARTICLES

Jan Selman and Hendricus A. Oosterhof, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Feb. 9, 1968, Ser. No. 704,269

Claims priority, application Great Britain, Feb. 24, 1967, 8,861/67

Int. Cl. B29c *25/00;* C08g *17/02;* D01f *1/02*

U.S. Cl. 264—235 10 Claims

The extensibility, impact properties, hardness, softening temperature, water absorption and solvent resistance of shaped articles of substantially unstretched polylactones (polypivalolactone) are significantly improved by thermal after-treatment, i.e., by annealing without deformation at a temperature between about 140° and 230° C.

3,577,503

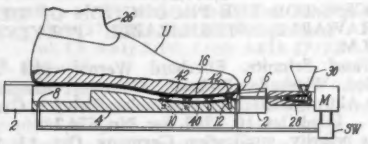
PROCESS OF MAKING ATHLETIC SHOES WITH INJECTION MOLDED SOLE

Thomas J. Innocenti, Beverly, Mass., assignor to USM Corporation, Flemington, N.J.

Original application Nov. 13, 1967, Ser. No. 681,997. Divided and this application Dec. 5, 1968, Ser. No. 781,346

Int. Cl. A43d *65/02;* B29h *7/08*

U.S. Cl. 264—244 1 Claim



Method for making an athletic shoe with an injection molded sole having means for receiving spikes or other projections to be attached to the sole, said means being embedded in the sole.

3,577,504

METHOD OF MANUFACTURING A GIRDER WITH A WEB OF REINFORCED AND/OR PRESTRESSED CONCRETE

Abraham Icchok Lipski, 85 Avenue de Boetendael, Brussels, Belgium

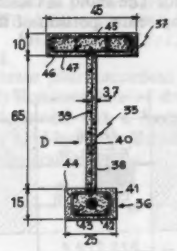
Continuation-in-part of application Ser. No. 533,697, Mar. 11, 1966. This application Feb. 28, 1969, Ser. No. 803,217

Claims priority, application Belgium, Mar. 26, 1965, 661,699; Dec. 8, 1965, 673,451

Int. Cl. B28b *1/02;* F04b *1/02, 1/08*

U.S. Cl. 264—255 5 Claims

A method for manufacturing a girder with a thin web in reinforced or prestressed concrete, the web thickness being 2 cm. plus 6% of the width up to 50 cm. width and 5 cm. plus 2.5% of the width thereafter. Said thin web is prefabricated independently of at least one flange



in a horizontal flat mould. Said flanges are thereafter integrated with said thin web.

3,577,505

CENTRIFUGAL MOLDING PROCESS FOR MANUFACTURING HUME-TYPE CONCRETE PIPES

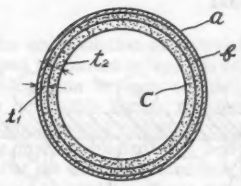
Koreyoshi Ichihara, Kawasaki, Japan, assignor to Nippon Hume Pipe Co., Ltd.

Continuation-in-part of application Ser. No. 492,516, Oct. 4, 1965. This application July 17, 1969, Ser. No. 842,574

Claims priority, application Japan, Feb. 8, 1965, 40/6,879

Int. Cl. B28b *1/16, 1/20*

U.S. Cl. 264—256 6 Claims



A method of manufacturing Hume-type concrete pipes by centrifugal molding. A predetermined quantity of cement slurry is introduced into a rotating pipe mold to form a layer of one density and rigidity and subsequently, a predetermined quantity of cement slurry having another density and rigidity is introduced to form another layer. One of the slurries is a hard kneaded slurry having a water content of less than saturation and of less than that required for molding. Another of the slurries is a soft kneaded slurry having a water content greater than saturation and of more than required for molding. The pipe mold is rotated such that centrifugal force commingles the surplus water from the one layer into the other layer to form a single layer having a uniform thickness and having a water content having substantially no surplus. The force created is insufficient to provide a separation of water from the slurry during molding. A single layer water content ratio of 30 to 35% water to cement is achieved.

3,577,506

FABRICATION OF ULTRA-THIN WALL BOBBINS

Augustus B. Brown, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

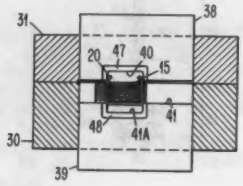
Filed Mar. 4, 1969, Ser. No. 804,173

Int. Cl. B29d *3/00*

U.S. Cl. 264—272 3 Claims

A short length of sheet-like B-stage polyesters supported by a nylon substrate is partially wrapped around a center

portion of a laminated pole piece for a magnetic read-or-record head, preferably with the B-stage polyester contacting the pole piece. The assemblage is placed in a heated compression mold. The mold is closed to form an annular space about the center portion of the pole piece and



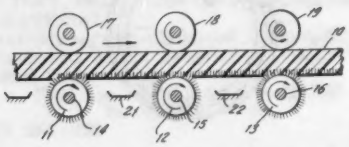
causes the polyester and nylon to flow about the pole piece to fill the space, thereby forming a unitary annular bobbin with a wall thickness selected in the range from about 1 mil to 15 mils. After the polyester/nylon conglomerate has cured, the pole piece with the bobbin is removed from the mold.

3,577,507

TUFTING PROCESS FOR FOAMED PLASTIC STRUCTURES

Herbert O. Corbett, Bridgeport, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jan. 3, 1967, Ser. No. 606,802
Int. Cl. B26d *3/00*
U.S. Cl. 264—321 **3 Claims**



A tufted product such as a blanket or rug or other material having a rug or blanket like structure is formed by shredding the outer surface of an elongated foamed plastic sheet. In the shredding process, the foamed plastic sheet is carried over rolls having wire bristles extending from their surface which stab into the surface of the foamed sheet and shred the surface to produce the effect of a tufted or napped surface. Both sides of the foamed sheet are tufted by threading the sheet above and below sequentially arranged wire bristle rollers.

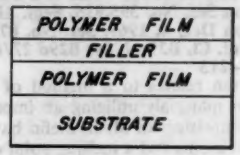
3,577,508

COATING AND LAMINATING PROCESS

Charles W. Desaulniers, Franklin, Mass., assignor to W. R. Grace & Co., New York, N.Y.

Original application Oct. 17, 1966, Ser. No. 587,194, now Patent No. 3,499,820, dated Mar. 10, 1970. Divided and this application July 15, 1969, Ser. No. 869,414
Int. Cl. B32b *19/02*; B44d *1/14*
U.S. Cl. 264—331 **10 Claims**

A process for preparing a self-supporting laminate having a low permeability to gases, comprising applying a coating of a film-forming polymer-diluent system to a substrate; adjusting the thickness of the coating; drying the coating to a solid state; applying a coating of a dispersion of a mineral, inorganic, or organic filler having a platelike structure to the resulting film; adjusting the thickness of the coating of filler; applying at least one coating or the film-forming polymer-diluent system to the



dried coating of filler; adjusting the thickness of the coating of film-forming diluent system; and drying the coating of film-forming diluent system.

3,577,509

PREVENTION OF SLUMPING IN THE MANUFACTURE OF A TAR BONDED REFRACTORY

Max Hicguet, Boulogne, Hauts-de-Seine, France, assignor to Societe d'Etudes et de Recherches Scientifiques et Minieres, Paris, France

No Drawing. Continuation of application Ser. No. 577,136, Sept. 6, 1966. This application July 25, 1967, Ser. No. 655,963
Claims priority, application France, Sept. 8, 1965, 30,765
Int. Cl. C04b *41/30*
U.S. Cl. 264—336 **13 Claims**

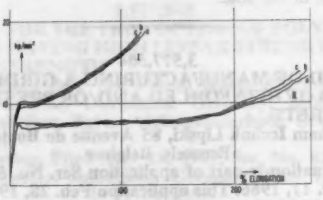
To prevent pressed hot tar bonded brick from slumping while cooling to a temperature below the softening point of the tar binder the ejected brick are placed on pallets that support at least two of the vertical faces of the brick. The mold box on the brick press is maintained at a controlled temperature to harden the pressed brick to a sufficient depth to allow them to be handled from the press onto the pallets. This technique is used in processes that use low softening point tar binders, e.g., a tar having a softening point in the range of 39–80° C.

3,577,510

PROCESS FOR THE PRODUCTION OF DEEP-DRAWABLE, STERILIZABLE POLYESTER FILM

Peter Josef Schmitz, Eberhard Werner, and Walter Seifried, Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Oct. 10, 1967, Ser. No. 674,244
Claims priority, application Germany, Oct. 13, 1966, K 60,455
Int. Cl. B29c *25/00*
U.S. Cl. 264—342 **2 Claims**



This invention relates to a process for the production of deep-drawable, sterilizable polyester film having a good shelf life in which stress is applied to an amorphous polyester film in orthogonal directions in the plane of the

film, whereby the film is thinned to at most ⅓ of the original film thickness, and the film is then at most doubled in thickness due to retardation at temperatures between 120° and 140° C.

3,577,511

PROCESS AND COMPOSITIONS FOR DIFFERENTIAL DIAGNOSIS OF THE MEGALOBLASTIC ANEMIA SYNDROMES

Adrian Leonard Luhby, 2794 Webb Ave., New York, N.Y. 10468

No Drawing. Filed Feb. 21, 1968, Ser. No. 707,303
Int. Cl. G01n *33/16*
U.S. Cl. 424—9 **22 Claims**

A method and several compositions for the accurate and early differential diagnosis of the deficiency states causing macrocytic megaloblastic anemia syndrome is provided in which one of several combinations of specified amino acids or other specific precursor compounds are administered to the test subject in metabolic loading doses and the urinary excretion of certain unusual metabolic products is determined. The metabolic anomaly in folic acid deficiency states is formiminoglutamic acid (FIGLU); in cobalamin vitamin B_{12} deficiency states it is methylmalonate (MMa). This diagnostic procedure described herein is positive even before the characteristic anemia is developed. The results of the diagnostic procedure described permits from the analysis of one urine specimen the accurate and definitive identification of the presence and severity of a folic acid and/or vitamin B_{12} deficiency state and thus affords a basis for determining specifically those two deficiency states. Other aspects of the invention are described in the specification.

3,577,512

SUSTAINED RELEASE TABLETS

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, Ser. No. 650,259, June 30, 1967, and Ser. No. 654,044, July 5, 1967. This application Oct. 11, 1968, Ser. No. 766,840
The portion of the term of the patent subsequent to Apr. 27, 1988, has been disclaimed
Int. Cl. A61j *3/06, 3/10;* A61k *27/12*
U.S. Cl. 424—21 **13 Claims**

Sustained release dosage forms, e.g. tablets or pills, are prepared comprising a therapeutically active material and a hydrophilic acrylate or methacrylate polymer mixed therewith and/or as a coating therefor. Preferably, the polymer is cross-linked, most preferably by employing a diester of the acrylate or methacrylate in minor amounts.

3,577,513

PELLETS FOR SUPPLYING BIOLOGICALLY ACTIVE SUBSTANCES TO RUMINANTS CONTAINING MAGNESIUM AND COATED IRON PARTICLES

Peter Roebuck and Derek James Whitehead, Swinton, Manchester, England, assignors to Pfizer Inc., New York. N.Y.

No Drawing. Filed Dec. 20, 1967, Ser. No. 691,962
Claims priority, application Great Britain, Dec. 21, 1966, 57,219/66
Int. Cl. A61j *3/00, 3/07, 3/08*
U.S. Cl. 424—22 **4 Claims**

A pellet for ruminants containing magnesium or magnesium alloy and iron particles, the latter having been treated to form an oxide or other refractory coating thereon.

3,577,514

SUSTAINED RELEASE PHARMACEUTICAL TABLETS

Ira C. Robinson, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Filed June 10, 1968, Ser. No. 735,571
Int. Cl. A61k *27/12*
U.S. Cl. 424—22 **4 Claims**

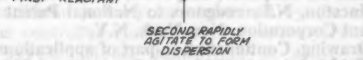
A sustained release pharmaceutical tablet characterized by a substantially constant rate of drug release comprising: (a) a medicament; (b) a hydrophobic dissolution retardant; (c) an acid-insoluble release agent; and (b) a water-soluble or dispersible binder.

3,577,515

ENCAPSULATION BY INTERFACIAL POLYCONDENSATION

Jan E. Vandegaer, Wayne, N.J., assignor to Pennwalt Corporation

Continuation-in-part of abandoned application Ser. No. 525,038, Feb. 4, 1966, which is a continuation-in-part of abandoned application Ser. No. 330,255, Dec. 13, 1963. This application Mar. 4, 1968, Ser. No. 710,293
Int. Cl. A01n *17/00;* B01j *13/02;* B44d *1/02*
U.S. Cl. 424—32 **19 Claims**


FIRST, CHARGE WITH CONTINUOUS AND DISCONTINUOUS LIQUIDS INCLUDING FIRST REACTANT
LIQUID BODY
THIRD, LOWER RATE OF AGITATION WHILE ADDING SECOND REACTANT
SECOND, RAPIDLY AGITATE TO FORM DISPERSION

Procedure for encapsulation of materials initially embodied, contained or carried in liquid is effected by interfacial polycondensation between coacting intermediates respectively in immiscible liquids, droplets of one liquid which is to be encapsulated and which contains one intermediate, being first established in a body of the other liquid. Thereafter the second intermediate is incorporated in the other liquid to produce minute capsules of the first liquid having a skin of polycondensate, e.g. polyamide, polysulfonamide, polyester, polycarbonate, polyurethane, or polyurea. Notably effective operation involves continuously supplying both the first liquid containing the first intermediate, and the second liquid, into a region where continuous agitation effects dispersion of the first liquid as droplets, the dispersion being continuously brought together with the second intermediate, thereby continuously establishing the droplet dispersion in liquid containing the second intermediate, and in consequence continuously producing encapsulated droplets by interfacial polycondensation between the intermediates.

3,577,516

PREPARATION OF SPRAY ON BANDAGE

Francis E. Gould, Princeton, and Thomas H. Shepherd, Hopewell, N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, now Patent No. 3,520,949, Ser. No. 650,259, June 30, 1967, and Ser. No. 654,044, July 5, 1967. This application Dec. 2, 1969, Ser. No. 881,376
Int. Cl. A61l *15/00*
U.S. Cl. 424—46 **17 Claims**

A bandage is formed in situ on a wound by spraying on separately or simultaneously a hydrophilic water insoluble polymer and a high boiling plasticizer or solvent

therefor. Preferably the polymer is a hydroxy lower alkyl acrylate or methacrylate. Medically active ingredients can be included in the composition.

3,577,517

ACRYLIC OR METHACRYLIC ACID COPOLYMER IN RESINOUS AEROSOL HAIR PREPARATIONS

Ikuo Kubot, Sakai-shi, and Masakatsu Mikami and Seikichi Kitamura, Kyoto, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, and Goo Chemical Industry Co., Ltd., Kyoto, Japan

No Drawing. Filed Mar. 21, 1966, Ser. No. 535,675
Claims priority, application Japan, Mar. 26, 1965, 40/17,174
Int. Cl. A61k *7/06*
U.S. Cl. 424—47 **6 Claims**

A composition suitable for use as an aerosol hair lacquer comprises 30–70% of an organic solution containing 1–10 weight percent of a copolymer of (1) 5–40 weight percent of an ester of an aliphatic alcohol with acrylic or methacrylic acid; (2) 6–35 weight percent acrylic or methacrylic acid; and (3) 25–89 weight percent of some other vinyl monomer neutralized with a water soluble base and 70–30% of a spraying agent.

3,577,518

HYDROPHILIC HAIRSPRAY AND HAIR SETTING PREPARATIONS

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, now Patent No. 3,520,949, Ser. No. 650,259, June 30, 1967, Ser. No. 654,044, July 5, 1967, and Ser. No. 743,626, July 10, 1968. This application July 18, 1969, Ser. No. 843,245
Int. Cl. A61k *7/10*
U.S. Cl. 424—47 **27 Claims**

Hair spray and hair setting compositions are prepared from hydrophilic copolymers of hydroxyalkyl acrylates or methacrylates with mere hydrophobic alkyl acrylates or methacrylates or alkoxyalkyl acrylates or methacrylates. There can also be included polymerizable amino compounds or olefinic carboxylic acids.

Terpolymers of alkoxyalkyl acrylates or methacrylate with alkyl acrylates or methacrylates with olefinic carboxylic acids or unsaturated amines can also be used as can tetrapolymers of the monomers set forth.

3,577,519

PROCESS FOR CONTROLLING THE AMOUNT OF DENSIFICATION IN POLYURETHANE FOAMS AND PRODUCTS PRODUCED THEREBY

Mario A. Gambardella, Milford, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Continuation-in-part of abandoned applications Ser. No. 658,314, Aug. 4, 1967, and Ser. No. 715,116, Feb. 27, 1968. This application Nov. 29, 1968, Ser. No. 780,246
Int. Cl. C08g *22/44*; B29d *27/00*
U.S. Cl. 264—54 **8 Claims**

The exterior, less dense layers in a selected, flexible densified polyurethane foam prepared by applying a compressive force to a partially cured cellular material at a critical time to reduce its volume by a specified amount are reduced by maintaining the compressive force for between about 0.1 and about 10 minutes. If desired, the compressive means can be heated to a temperature between about 40° and about 200° C. The resulting foams are particularly useful for such applications as rug padding.

3,577,520

DENTIFRICE COMPOSITIONS CONTAINING 5,5-DIARYL - 2,4 - IMIDAZOLIDINEDIONES AND PROCESS OF TREATING PYORRHEA

Emile Constantin Savini, 44 Rue du Magasin a Poudre, 14 Caen, France, and Robert Poitevin, 6 Rue Anatole de la Forge, 75 Paris 17, France

No Drawing. Continuation-in-part of application Ser. No. 669,271, Sept. 20, 1967. This application Dec. 19, 1969, Ser. No. 886,754
Int. Cl. A61k *7/16*
U.S. Cl. 424—54 **8 Claims**

This invention relates to dentifrice compositions for treatment of dental alveolus pyorrhea containing a safe but effective amount of 5,5-diaryl-2,4-imidazolidinediones and to the method of treatment of dental alveolus pyorrhea which comprises topically applying to the effected area of the gums a dentifrice composition containing a safe but effective amount of 5,5-diaryl-2,4-imidazolidinediones.

3,577,521

STORAGE-STABLE FROTHING TOOTHPASTE

Karlheinz Scheller, Eislingen (Fils), Else Koddermann, Ebersbach (Fils), and Hans Trebs, Eislingen (Fils), Germany, assignors to Firma Dr. Scheller Duro Dont, Eislingen (Fils), Germany

No Drawing. Filed July 14, 1967, Ser. No. 653,315
Claims priority, application Germany, July 29, 1966, D 50,712
Int. Cl. A61k *7/16*
U.S. Cl. 424—55 **4 Claims**

A storage-stable toothpaste that froths in use; comprising a colloidal silica thickened alcohol system that contains a limited amount of water, peroxide as a gas producing agent and an acid salt as an acidifying agent. When mixed with water and/or saliva the peroxide reacts causing the paste to foam and the pH of the mixture shifts from acidic to basic within a few minutes.

3,577,522

METHODS FOR THE TREATMENT OF SHOCK WITH ETHYLENE OXIDE-POLYPROPYLENE GLYCOL CONDENSATES AS BLOOD PLASMA SUBSTITUTES

Alan C. Hymes, Hopkins, Minn., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of application Ser. No. 762,633, Sept. 25, 1968, which is a continuation-in-part of application Ser. No. 670,408, Sept. 25, 1967. This application Oct. 10, 1969, Ser. No. 865,521
Int. Cl. A61k *27/00*
U.S. Cl. 424—78 **5 Claims**

Isotonic solutions of certain ethylene oxide-polypropylene glycol condensation products have been found to be extremely effective as blood plasma substitutes in the treatment of shock.

3,577,523

WATER-INSOLUBLE ANTIGENIC SUBSTANCES AND METHOD OF PREPARING THE SAME AND ANTIGENIC DEPOT AGENTS INCORPORATING SUCH SUBSTANCES

Morris Emmanuel Stolar, Trumbull, Conn., and Joseph George Feinberg, London, England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Mar. 7, 1969, Ser. No. 805,378
Int. Cl. A61k *23/00*; C12k *5/00*
U.S. Cl. 424—88 **8 Claims**

Water-insoluble antigenic substances prepared by combining a liquid extract or suspension of an antigenic material with an insolubilizing agent such as a preformed aluminum tannate or in situ formed aluminum tannate, and antigenic depot agents incorporating these water-insoluble antigenic substances useful for stimulating prolonged antibody response.

3,577,524

DIMETHYLPOLYSILOXANE SUSPENSIONS OF BIOLOGICS AND PREPARATION THEREOF

Walter David Pratt, Spring Valley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 4, 1968, Ser. No. 709,940
Int. Cl. C12k *5/00*
U.S. Cl. 424—89 8 Claims

A stable suspension of a biological in dimethylpolysiloxane is provided containing one or more polyhydric alcohols. Exemplary of such stable suspensions is a suspension containing smallpox vaccine, dimethyl polysiloxane, 4 to 10% by weight mannitol, and 4 to 10% by weight sorbitol. The biological suspensions maintain their efficacy, potency, and suspension characteristics under prolonged storage and can be directly withdrawn from their containers and administered to the patient.

3,577,525

ADENOVIRUS VACCINE AGAINST CANINE HEPATITIS

James A. Baker, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

No Drawing. Original application July 1, 1964, Ser. No. 379,744, now Patent No. 3,346,456, dated Oct. 10, 1967. Divided and this application Aug. 15, 1967, Ser. No. 660,616
Int. Cl. C12k *71/00*
U.S. Cl. 424—89 1 Claim

A method of protecting a dog against infectious canine hepatitis by inoculation of the dog with live adenovirus alien to the dog.

3,577,526

STABILIZED SMALLPOX VACCINE

Louis R. Valette, Marcy L'Etoile, Rhone, France, assignor to Societe Anonyme dite: Institut Merieux, Lyon, Rhone, France

No Drawing. Filed June 13, 1969, Ser. No. 833,170
Int. Cl. A61k *27/10;* C12k *5/00*
U.S. Cl. 424—89 5 Claims

Smallpox vaccine is stabilized by dispersing the same in an aqueous solution containing sucrose. The solution can also contain dextran.

3,577,527

NEISSERIA MENINGITIDIS ANTIGEN

Earl A. Edwards, Lake Bluff, Ill., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,341
Int. Cl. A61k *27/00*
U.S. Cl. 424—92 8 Claims

An antigen of *N. meningitidis* which has a high degree of sensitivity and specificity for determining the presence of antibodies in blood is provided by a method in which *N. meningitidis* is subjected to a mild alkaline hydrolysis with production of a lipopolysaccharide antigen.

3,577,528

TWO PHASE HAIR CONDITIONER COMPOSITIONS

Everett G. McDonough, Yonkers, and Walter W. Edman, Port Washington, N.Y., assignors to Zotos International, Inc., Darien, Conn.

No Drawing. Filed May 27, 1966, Ser. No. 553,278
Int. Cl. A61k *7/06*
U.S. Cl. 424—70 5 Claims

A two phase hair conditioner having an aqueous and a water immiscible phase which evaporate at the same rate, which imparts along the hair shaft various hair treatment agents.

3,577,529

COMPOSITIONS AND METHODS FOR ENHANCEMENT OF THE GROWTH RATE OF POULTRY AND ANIMALS EMPLOYING ALKALI METAL FORMALDEHYDE SULFOXYLATES AND BISULFITES

Joseph Michael Pensack, Hopewell Township, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 17, 1968, Ser. No. 721,921
Int. Cl. A61k *21/00*
U.S. Cl. 424—114 11 Claims

A growth rate accelerator for poultry and farm animals having as one active component, an alkali metal formaldehyde bisulfite or an alkali metal formaldehyde sulfoxylate. The compositions can, in addition, contain other materials which enhance the growth rate of the host, such as tetracycline antibiotics, penicillins, zinc bacitracin, erythromycin and/or bis(5-nitrofurfurylidene)-acetoneguanylhydrazone. Growth rate accelerating compositions comprising the above-mentioned growth rate accelerators and ingestible diluents are also provided.

3,577,530

JANIEMYCIN

Edward Meyers, East Brunswick, William Lawrence Parker, Brunswick, Frank Lee Weisenborn, Somerset, Felix Edward Pansy, Jamesburg, and Pacifico Anthony Principe, South River, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed July 24, 1969, Ser. No. 844,342
Int. Cl. A61k *21/00*
U.S. Cl. 424—118 7 Claims

The antibiotic janiemycin is obtained by the cultivation under controlled conditions, of *Streptomyces macrosporeus* ATCC 21388. Janiemycin is active against bacteria.

3,577,531

DIANEMYCIN FOR TREATING COCCIDIOSIS

Marvin Gorman and Robert L. Hamill, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Sept. 11, 1968, Ser. No. 759,198
Int. Cl. A61k *21/00*
U.S. Cl. 424—122 1 Claim

Methods and compositions for controlling coccidiosis employing the antibiotic dianemycin and its alkali metal, alkaline earth, and basic nitrogen salts as the active anticoccidiosis agent.

3,577,532

DISINFECTED ANTACID COMPOSITIONS AND METHOD FOR THE PREPARATION THEREOF

George H. Schneller, Devon, and Ralph S. Levi, Norristown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 30, 1967, Ser. No. 650,243
Int. Cl. A61k *27/00;* A61l *13/00*
U.S. Cl. 424—149 6 Claims

Pharmaceutical or cosmetic compositions especially susceptible to microbiological contamination, are disinfected by treatment with chloramines.

3,577,533

ANTACID COMPOSITIONS CONTAINING BISMUTH ALUMINATE AND COPRECIPITATED ALUMINUM HYDROXIDE AND MAGNESIUM CARBONATE

Joseph Alfred Rider, Mill Valley, Calif. (255 Hugo St., San Francisco, Calif. 94122)

No Drawing. Continuation-in-part of abandoned application Ser. No. 500,268, Oct. 21, 1965. This application Feb. 21, 1968, Ser. No. 707,278
Int. Cl. A61k *27/00*
U.S. Cl. 424—155 3 Claims

The antacid compositions are novel pharmaceutical compositions containing bismuth aluminate and a copre-

cipitate of aluminum hydroxide and magnesium carbonate which are useful in the treatent of gastric disorders such as ulcer of the stomach or duodenum, gastritis, hiatal hernia, duodenitis and marginal ulcer.

3,577,534

STABLE ORALLY ACTIVE HEPARINOID COMPLEXES

Teow Yan Koh and Kekhusroo Rustomji Bharucha, Toronto, Ontario, Canada, assignors to Canada Packers Limited, Toronto, Ontario, Canada

No Drawing. Continuation-in-part of application Ser. No. 650,621, July 3, 1967. This application Feb. 14, 1969, Ser. No. 799,521

Claims priority, application Canada, June 20, 1968, 22,996/68

Int. Cl. A61k *17/18*

U.S. Cl. 424—183 **29 Claims**

This invention relates to new stable heparinoid complexes which are absorbable through the mucous membranes of the mammalian body, prepared by reacting heparinic acid or other acid heparinoids with non-toxic organic compounds having weakly basic or amphoteric properties and characterized by a base strength pK_b in the range of from about 7.0 to 12.5 or by an isoelectric point pI below about 9.7, to methods for preparing and using these new heparinoid complexes, and to therapeutic compositions containing them. Particularly suitable heparinoid complexes are those prepared from heparinic acid and amino acids having an isoelectric point pI below about 9.7.

3,577,535

TREATMENT OF THYROID HORMONE IMPAIRMENT PHARMACEUTICAL COMPOSITIONS CONTAINING 3,5,3' - L-TRIIODOTHYRONINE COMPLEXES

Harold C. Reynolds, Kankakee, and Donald B. Olsen, Bonfield, Ill., assignors to Armour Pharmaceutical Company, Chicago, Ill.

No Drawing. Original application June 29, 1966, Ser. No. 561,357, now Patent No. 3,477,954. Divided and this application Jan. 27, 1969, Ser. No. 794,408

Int. Cl. A61k *27/00*

U.S. Cl. 424—198 **3 Claims**

A pharmaceutical composition consisting of a pharmaceutically acceptable carrier and the reaction product formed by reacting less than a stoichiometric amount of a tertiary phosphine with thyroxine (free acid) in a dipolar aprotic solvent. The composition contains thyroxine (free acid) and 3,5,3'-L-triiodothyronine in a preselected ratio to each other and is useful for the treatment and control of body disorders associated with an impairment of the thyroid hormone function.

3,577,536

METHOD OF CONTROLLING INSECTS AND ARACHNIDS WITH TETRAHYDROQUINOXALINYL PHOSPHATES OR THIOPHOSPHATES

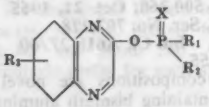
Bernard Miller, Amherst, Mass., and Tamara Helen Mladineo Gund, Mercer, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Aug. 7, 1967, Ser. No. 658,637, now Patent No. 3,505,327, dated Apr. 7, 1970. Divided and this application Mar. 31, 1970, Ser. No. 24,381

Int. Cl. A01n *9/36*

U.S. Cl. 424—200 **10 Claims**

A method of protecting crops and controlling insects or arachnids by applying a compound having the formula:



wherein X is a member selected from the group consisting of sulfur and oxygen; R_1 and R_2 are each lower alkyl, lower alkoxy, lower thioalkyl, phenyl, halophenyl, benzyl or $—NR_4R_5$; R_3 is hydrogen or lower alkyl; and R_4 and R_5 are each selected from the group consisting of hydrogen and lower alkyl.

3,577,537

TOPICAL ADMINISTRATION OF VITAMIN B–12

Eugene E. Howe, Somerset, and Charles Rosenblum, Princeton, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 629,918, Apr. 11, 1967. This application Mar. 9, 1970, Ser. No. 17,897

Int. Cl. A61k *25/02*

U.S. Cl. 424—201 **4 Claims**

Vitamin B–12 is administered to animals by topical application in a non-toxic solvent.

3,577,538

HALOGENATED PHOSPHONATES USED FOR CHEMOSTERILIZING SCREW-WORM FLIES

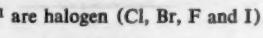
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,076

Int. Cl. A01n *9/36*

U.S. Cl. 424—214 **4 Claims**

Compounds of the following formula are insect chemosterilants:



wherein X and X^1 are halogen (Cl, Br, F and I).

3,577,539

SYNERGISTIC ANTIBACTERIAL COMPOSITION

Leonard J. Vinson, Glen Rock, N.J., assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation of application Ser. No. 800,732, Feb. 19, 1969, which is a continuation-in-part of application Ser. No. 642,327, May 31, 1967, which in turn is a continuation-in-part of application Ser. No. 444,411, Mar. 31, 1965. This application Jan. 19, 1970, Ser. No. 4,471

Int. Cl. A61k *27/00*

U.S. Cl. 424—231 **2 Claims**

The specification discloses germicidal compositions containing phenolic germicides, such as p-tert-amylphenol, o-phenylphenol, o-benzyl-p-chlorophenol, and polybromosalicylanilide, such as 3,4',5-tribromosalicylanilide and 4',5-dibromosalicylanilide.

3,577,540

METHOD OF PROMOTING OSTEOGENESIS

Dirck V. Myers, Atlanta, Ga., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

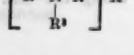
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,162

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 **8 Claims**

A method of promoting osteogenesis in animal hosts which comprises applying to the area of a bone defect a quaternary ammonium compound of the formula

wherein R represents lower alkyl, X represents chlorine or bromine, and *n* is an integer from six to twelve; or of the formula



wherein R^4 represents an alkyl group containing twelve to twenty carbon atoms; R^1, R^2 and R^3 each represent lower alkyl, and R^1, R^2 and R^3 taken together with the nitrogen atom represent pyridinium; and X represents chlorine or bromine.

3,577,541

COMPOSITIONS AND METHODS FOR EFFECTING TRANQUILITY WITH TRIAZINES

John Thomas Shaw, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 240,745, Nov. 28, 1962, now Patent No. 3,505,322, dated Apr. 5, 1970. This application July 23, 1963, Ser. No. 296,915

Int. Cl. A61k *27/00*

U.S. Cl. 424—249 5 Claims

(N-monooxyamino)-s-triazines for effecting tranquilization.

3,577,542

INSECT CHEMOSTERILANT HYDROXYETHYLAMINO PYRIMIDINES

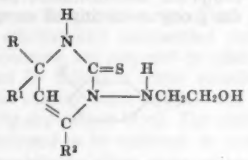
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,081

Int. Cl. A01n *9/22*

U.S. Cl. 424—251 8 Claims

Compounds of the following formula are insect chemosterilants:



wherein R, R^1 and R^2 are selected from the group consisting of hydrogen and alkyl of not more than 4 carbon atoms.

3,577,543

INSECTICIDAL AND FUNGICIDAL 2-AMINOPYRIMIDINYL-6-CARBAMATE COMPOSITIONS

Francis Leslie Charles Baranyovits, Ranajit Ghosh, Nigel Douglas Bishop, and Peter Frank Hilary Freeman, Bracknell, and William Glynne Moss Jones, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Original application Mar. 10, 1967, Ser. No. 622,043, now Patent No. 3,493,574, dated Feb. 3, 1970. Divided and this application Nov. 14, 1969, Ser. No. 871,296

Claims priority, application Great Britain, Mar. 31, 1966, 14,272/66

Int. Cl. A01m *9/22*

U.S. Cl. 424—251 6 Claims

Pesticidal compositions containing a 2-aminopyrimidinyl-6-carbamate or salts thereof. Representatve active ingredients are 5,6-dimethyl-2-dimethylamino-4-dimethylcarbamoyloxypyrimidine and the corresponding 5-ethyl-6-methyl, 5-n-propyl-6-methyl, 5-cyanoethyl-6-methyl derivatives. These compounds may be used in the form of dusting powders or granules, dips or sprays to combat fungal and/or insect infestations in plants and animals. They may also be used in fertilizers or otherwise to treat agricultural soils.

3,577,544

METHODS FOR PRODUCING MUSCLE RELAXANT AND CNS-DEPRESSANT EFFECTS WITH 3-AMINO-4-PHENYL FURAZAN AND COMPOSITION THEREFOR

Claude Lehmann and Ernst Renk, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Filed Feb. 2, 1968, Ser. No. 702,550

Claims priority, application Switzerland, Jan. 26, 1968, 1,250/68

Int. Cl. A61k *27/00*

U.S. Cl. 424—272 2 Claims

Methods and compositions for producing anti-convulsive, muscle-relaxing, and CNS-depressing effects in mammals, by administration of an effective amount of 3-amino-4-phenyl-furazan.

3,577,545

N-TETRAHALOETHYLTHIO PYRAZOLES AS BACTERICIDES AND FUNGICIDES

Joseph G. E. Fenyes, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application June 5, 1967, Ser. No. 643,415, now Patent No. 3,409,632, dated Nov. 5, 1968. Divided and this application Dec. 21, 1967, Ser. No. 703,816

Int. Cl. A01n *9/22*

U.S. Cl. 424—273 8 Claims

N-(1,1,2,2-tetrahaloethylthio) pyrazoles in which the pyrazole nucleus is substituted in the 3 and 5 positions with hydrogen or lower alkyl groups and in the 4 position with hydrogen, halogen or a nitro group. Compounds of this class are fungicidal and bactericidal. They are made by reacting a pyrazole or its alkali metal salt with tetrahaloethylsulfenyl halides.

3,577,546

USE OF POLYCHLORO KETO-ALKENOIC ACIDS AND DERIVATIVES THEREOF AS INSECTICIDES

William A. Erby, Alburtis, and Robert A. Walde, Emmaus, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

No Drawing. Filed Apr. 8, 1966, Ser. No. 541,096

Int. Cl. A01n *9/28*

U.S. Cl. 424—279 7 Claims

A method for killing insects which comprises contacting the insects with an insecticidally effective amount of a polychloro keto-alkenoic acid or derivative thereof.

3,577,547

COMPOSITION PROTECTING AGAINST THE ACTION OF MICROORGANISMS AND ITS MANNER OF USE

Jean-Paul Pelissier, Vitry-sur-Seine, and Pierre Chiffert, Marseille, France, assignors to Societe Anonyme: Produits Chimiques Industriels & Agricoles Procida S.A., St. Marcel Marseille, Bouches du Rhone, France

No Drawing. Continuation-in-part of application Ser. No. 318,440, Oct. 23, 1963. This application Apr. 8, 1968, Ser. No. 719,715

Claims priority, application France, Nov. 23, 1962, 916,456

Int. Cl. A01n *9/02*

U.S. Cl. 424—286 6 Claims

The invention prevents damage to liquid or wet paper pulp by microorganisms and forestalls or destroys the microbic ooze that forms in the water of systems of paper mills by use of a composition comprising a mixture of (1) alkali metal or alkaline earth metal salts of di(lower alkyl) dithiocarbamic acid, chiefly alkali metal dimethyl dithiocarbamate, (2) alkali metal of (lower alkylene)-bis-dithiocarbamic acid, chiefly (ethylene) - bis - dithio-

carbamic acid, and (3) a stabilizer consisting of 1,8,3,6 diendomethylene 1,3,6,8 tetraazacyclodecane, also known as 1,3,6,8 diendomethylene 1,3,6,8 tetraazacyclodecane.

3,577,548

METHODS FOR STERILIZING INSECTS WITH TRIARYLTIN COMPOUNDS

Eugene E. Kenaga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 244,917, Dec. 17, 1962. This application Dec. 31, 1964, Ser. No. 422,554

Int. Cl. A01n *9/22, 9/00*

U.S. Cl. 424—288 **25 Claims**

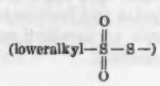
Methods for administering to an animal a minimal sterilant amount of a triaryltin compound of the group of

$$R_3—Sn—Z$$

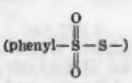
and

$$(R_3—Sn)_2Y$$

wherein, in all of its occurrences in any given triaryltin compound, R represents the same member selected from the group consisting of phenyl, mono-substituted phenyl wherein the substituent is a member selected from the group consisting of halo, loweralkyl, and loweralkoxy; Z represents a monovalent moiety selected from the group consisting of (phenylloweralkyl), alkenyl, alkadienyl, cycloalkenyl, cycloalkadienyl, halo, hydroxy, mercapto, hydrogen, alkanoate, alkenoate, loweralkoxy, loweralkylthio, diloweralkylcarbamate, diloweralkylthiocarbamate, diloweralkyldithiocarbamate, radical of the formula

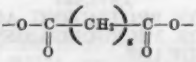


radical of the formula



and radical of the formula —Sn—R_3; and Y represents a divalent moiety selected from the group consisting of —O—, —S—, methylene, ethylene, ethynylene,

carbonyl, 1,3-butadien-1,4-ylene, and



wherein *g* is an integer of from 1 to 10, both inclusive.

3,577,549

TREATMENT OF PAIN OR INFLAMMATION WITH P-BENZOYL-PHENYLACETIC ACID OR O-BENZOYL-PHENYLACETIC ACID

David Jack and Deryck Rhodes, London, England, assignors to Allen & Hanburys Limited, London, England

No Drawing. Filed Aug. 9, 1968, Ser. No. 751,379

Claims priority, application Great Britain, Aug. 21, 1967, 38,424/67

Int. Cl. A61k *27/00*

U.S. Cl. 424—317 **2 Claims**

Pharmaceutical compositions comprising as active ingredient either p-benzoyl-phenylacetic acid, or o-benzoyl-phenylacetic acid, which compounds may be used in the form of physiologically acceptable salts. These active ingredients have anti-inflammatory and analgetic activity. They may be administered in dosage unit form.

3,577,550

N-(PHENOXY)PHENYL-SALICYLAMIDES AND THEIR UTILIZATION AS MOLLUSCIDIDES

Clarence L. Moyle, Clare, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 2, 1968, Ser. No. 726,205

Int. Cl. A01n *9/20*

U.S. Cl. 424—324 **3 Claims**

Novel N-(phenoxy)phenyl-salicylamides and their preparation by reaction between a salicylic acid, phosphorus trichloride and a phenoxyaniline. They are useful as molluscidides.

3,577,551

METHODS FOR TREATING PAIN, INFLAMMATION AND COUGH

Masuo Murakami and Kaname Kuriaki, Tokyo, Masaru Iwanami, Kanagawa, Hideki Arima, Tokyo, Kenji Sano and Hiroshi Suzuki, Saitama, and Soichi Kagami, Tokyo, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

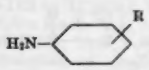
No Drawing. Filed Apr. 15, 1969, Ser. No. 816,400

Claims priority, application Japan, Apr. 20, 1968, 43/26,514

Int. Cl. A61k *27/00*

U.S. Cl. 424—325 **3 Claims**

A method of alleviating pain, inflammation and/or cough which comprises administration of a compound selected from the group consisting of compounds of the formula:



wherein R may be hydrogen or lower alkyl, and their pharmaceutically acceptable acid addition salts.

3,577,552

METHOD OF INDUCING LOCAL ANESTHESIA

Bernard M. Regan, Chicago, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

No Drawing. Continuation-in-part of application Ser. No. 741,235, June 28, 1968. This application May 8, 1970, Ser. No. 35,941

Int. Cl. A61k *27/00*

U.S. Cl. 424—326 **6 Claims**

A method of inducing local anesthesia by administering to animals a benzoxyalkyl substituted thiopseudourea, for example, 2-(2 - benzoxyethyl) - 2 - thiopseudouronium chloride.

3,577,553

COMPOSITIONS AND METHODS FOR CONTROLLING COCCIDIOSIS IN POULTRY EMPLOYING TRIAZOLE DERIVATIVES

Robert J. Ferlauto, Perkasie, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed Jan. 29, 1969, Ser. No. 795,043

Int. Cl. A61k *27/00*

U.S. Cl. 424—269 **10 Claims**

Chemotherapeutic compositions useful for the prevention and control of coccidiosis comprising adducts between a benzaldehyde or a cinnamaldehyde and an aminotriazole or between an alkyl aryl ketone and an amino-

triazole, optionally substituted in the aromatic ring, are described as specific and novel compounds useful for the prevention and control of coccidiosis.

3,577,554
SELF-CURING LATEX FOAM COMPOSITIONS
Donald B. Parrish, Lake Jackson, and James M. McDuff, Angleton, Tex., asssignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed May 24, 1967, Ser. No. 640,791
Int. Cl. C08f *47/10*; C08j *1/16*
U.S. Cl. 260—2.5 **13 Claims**

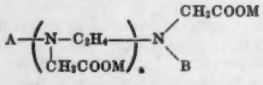
A film-forming latex of a copolymer of an α,β-ethylenically unsaturated carboxylic acid, such as an acrylic acid, and a copolymerizable ethylenically unsaturated monomer is reacted with an aziridine at a pH below about 5 to form a copolymer having aminoester groups and carboxyl groups and the pH then is adjusted to above 7. The resulting stable latex, optionally containing formulating ingredients, is frothed, dried and cured to obtain a latex foam. Often the frothed composition is applied in the wet state to an adherent substrate, e.g., to a textile, then cured and dried to form an article such as a drapery.

3,577,555
CARBON BLACK IN PAPER COATING LATEX
Robert A. Forrester and Ralph E. McNay, Houston, Tex., assignors to Ashland Oil, Inc., Houston, Tex.
No Drawing. Filed June 22, 1966, Ser. No. 559,423
Int. Cl. C08d *7/00*
U.S. Cl. 260—17.4 **8 Claims**

Stable aqueous slurries of carbon black and latexes of polymers of ethylenically unsaturated monomers, especially diene polymers, are prepared by adding a dispersing agent prepared by mixing a water soluble natural gum with an anionic surface active agent to the polymer latex, and then adding dry carbon black. The amount of dispersing agent is selected to be sufficient to stabilize the latex against the destabilizing effect of the carbon black. Stable latex slurries can be prepared at 30–60% latex polymer and an amount of carbon black equal to or greater than the latex polymer content.

3,577,556
POLYAMINES STABILIZED WITH AMINOCARBOXYLATE CHELANTS
Juan Longoria III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 5, 1968, Ser. No. 695,835
Int. Cl. C07c *87/14, 119/00*; C08g *51/60*
U.S. Cl. 260—45.85 **9 Claims**

Aminocarboxylate chelants of the formula;



where A and B are independently $-C_2H_4OH$ or

$-CH_2COOM$

a is 0–2, and M is a monovalent cation are effective stabilizers for polyamines including alkylenepolyamines, polyalkylenepolyamines and polyalkylenimines. Addition of about 0.05–10.0 weight percent of the chelant reduces the acid catalyzed and oxidative degradation and discoloration of these polyamines.

3,577,557
BENZO[1,5]DIAZOCINONES
Hans Ott, Convent Station, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Dec. 9, 1966, Ser. No. 600,403
Int. Cl. C07d *53/00, 51/48*
U.S. Cl. 260—239.3 **20 Claims**

The invention discloses compounds of the class of 6-phenyl-3,4-dihydro[1,5]benzodiazocin-2-(1H)-ones useful as tranquilizers. Also disclosed is preparation of said compounds featuring intermediates which are 1,5-methano-1,5-benzodiazocin-2-ones which are converted by acid treatment to the corresponding 6-phenyl-3,4,5,6-tetrahydro[1,5]benzodiazocin-2-(1H)-ones which in turn may be oxidized to obtain the first-mentioned class of compounds.

3,577,558
1-AMINOALKYLAMINO-4-ALKOXYMETHYL-THIOXANTHENE DERIVATIVES
David Rosi, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Filed Apr. 15, 1968, Ser. No. 721,190
Int. Cl. C07d *65/16, 7/42*; A61k *27/00*
U.S. Cl. 260—328 **5 Claims**

1-aminoalkylamino - 4 - (lower-alkoxymethyl)thioxanthenes, -thioxanthene-S-oxides or -dioxide, -xanthenes and -9-one derivatives thereof, having schistosomicidal activity, are prepared by reacting the corresponding 4-hydroxymethyl compounds with a lower-alkanol in an acidic medium, e.g., in the presence of a strong acid, e.g., p-toluenesulfonic acid.

3,577,559
PROCESS FOR MAKING GLYCOL ETHERS AND GLYCOL ESTERS
Lee H. Horsley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 19, 1968, Ser. No. 699,055
Int. Cl. C07c *69/76*
U.S. Cl. 260—410.6 **11 Claims**

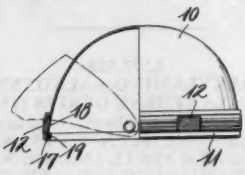
Glycol ethers or glycol esters having the formula $ROC_mH_{2m}ZC_nH_{2n}OH$ are prepared by reacting a compound having the formula ROH, a cyclic compound having the formula $C_mH_{2m}Z$ and having at least three and not more than five carbon atoms in the ring and a vicinal alkylene oxide having the formula $C_nH_{2n}O$ where the molar ratio of $C_mH_{2m}Z$ to vicinal oxide is between one to ten and ten to one, the molar ratio of vicinal oxide plus $C_mH_{2m}Z$ to ROH is at least one to one, R is acyl having at least two and not more than eighteen carbon atoms or aryl having up to two aromatic rings, Z is oxygen or sulfur, *m* is an integer of from three to fifteen inclusive and *n* is an integer of from two to four inclusive. They are useful as solvents, lubricants, hydraulic fluids and chemical intermediates.

3,577,560
METHOD OF FORMING PELLETS OF A FLUX COMPOSITION
Garth D. Lawrence, Midland, and Jack J. Ott, Hemlock, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Mar. 27, 1968, Ser. No. 716,359
Int. Cl. B01j *2/02*
U.S. Cl. 264—8 **5 Claims**

The present invention comprises a method of preparing a pelleted flux product by melting a flux composition while maintaining a continuous cover of unmelted flux over the molten portion, forming the melt into molten droplets, and solidifying the droplets into discrete particles or pellets.

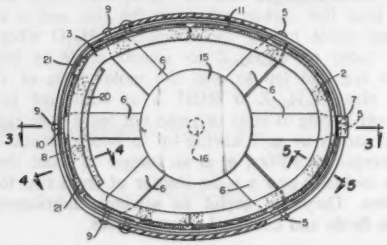
GENERAL AND MECHANICAL

3,577,561
HELMET FOR ACCIDENT PREVENTION
Ichiro Oshima, Ota-Shi, Japan (c/o Oshima Denki Seisakusho Co. Ltd., No. 42, Fujikura)
Continuation of application Ser. No. 648,393, June 23, 1967, now abandoned. This application Aug. 13, 1969, Ser. No. 850,345
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 **3 Claims**



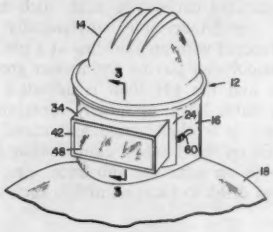
This invention is intended to provide a helmet for accident prevention comprising in combination a helmet and a plurality of reflectors, said reflectors being attached to outer portions of the helmet, each of said reflectors having a number of reflector elements and adapted to reflect an incident ray of light substantially in the direction of the light source, thereby enabling the user, such as, for example, a driver of motorcycle, to be easily found even in the dark by other person, such as, for example, a driver of car. Thus, with the helmet, accidents, particularly a night traffic accident may be prevented from occurring.

3,577,562
ATHLETES' PROTECTIVE HELMET PARTICULARLY FOOTBALL
Mike C. Holt, Leesburg, Fla. (Southern Athletic Service, Inc., P. O. Box 46, Leesburg, Fla. 32748)
Continuation-in-part of application Ser. No. 839,585, July 7, 1969. This application Oct. 1, 1969, Ser. No. 862,663
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 **5 Claims**



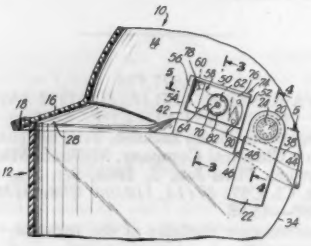
The protective helmet has a shell of hard, rigid plastic material, and radially suspended pads that entirely encircle the wearer's head. The front pad and the rear pad are each fastened to the horizontal plastic bands, which encircle the inner circumference of the shell. The pads are affixed to the respective plastic bands by mating tapes, one on the inside surface of the plastic band and the other on the outer surface of the pad, whereby when pushed together the pad is held to the plastic band. Each plastic band is held securely to the shell by spaced rivets. In the front there is one plastic band, and in the rear there are two longitudinal plastic bands, one being higher than the other, the higher band being at approximately the same level as the front plastic band. The rear pad extends slightly below the edge of the helmet to protect the neck better. Because the plastic bands are spaced from the inner surface of the shell, this affords air circulation that keeps the helmet cool—the advantage of this padded helmet over other padded helmets.

3,577,563
INSERT FOR HEAD PROTECTING HOODS
Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company,, Sausalito, Calif.
Continuation of application Ser. No. 697,950, Jan. 15, 1968, now abandoned. This application Aug. 25, 1969, Ser. No. 853,622
Int. Cl. A61f *9/06*
U.S. Cl. 2—8 **3 Claims**



An insert for the faceplate of a protective hood, which insert is curved on one side to conform with the curvature of the faceplate and flat at another side so as to define a planar opening for receiving a flat transparent plate. Clips or a resilient frame member on the insert retain the transparent plate in place and are conveniently movable to afford quick insertion and removal of the transparent plate so that such plate can be replaced as needed.

3,577,564
FACE SHIELD
Rodney S. Hill, Dover, Del., assignor to ILC Industries, Inc.,, Dover, Del.
Filed Aug. 26, 1968, Ser. No. 755,463
Int. Cl. A61f *9/04*
U.S. Cl. 2—10 **6 Claims**

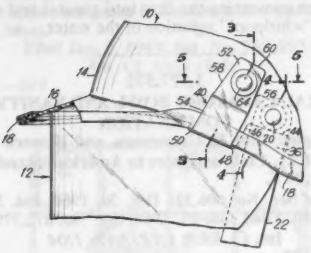


Protective face shield and mounting means therefor which enable quick and easy structural association and disassociation relative to protective headgear, such as a helmet shell, while providing positive restraint against rotation or pivoting movement of the face shield inwardly toward the face of a wearer.

3,577,565
FACE SHIELD
Frederick W. Feldmann, and Rodney S. Hill, Dover, Del., assignors to ILC Industries, Inc., Dover, Del.
Filed Aug. 26, 1968, Ser. No. 755,464
Int. Cl. A61f *9/04*
U.S. Cl. 2—10 **8 Claims**

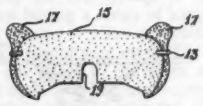
Protective face shield and mounting means therefor which enable quick and easy structural association and disassocia-

tion relative to protective headgear, such as a helmet shell, while providing positive restraint against rotation or pivoting



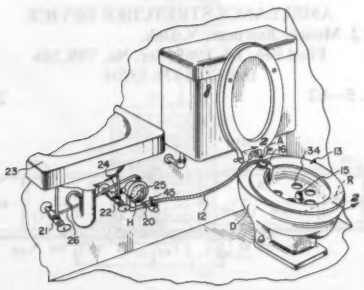
movement of the face shield inwardly toward the face of a wearer.

3,577,566
SPECTACLE HOOD
Benjamin Kislin, and J. W. Miller, San Antonio, Tex.
Filed Nov. 21, 1968, Ser. No. 777,791
Int. Cl. A61f *9/04; G02c 7/16*
U.S. Cl. 2—12 **1 Claim**



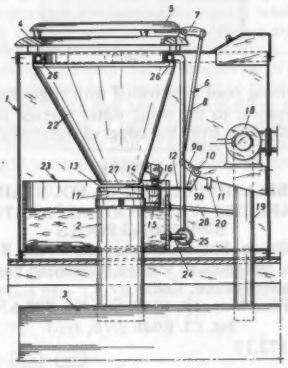
A spectacle hood having an opaque front with an appropriate cutout section conforming to the configuration of the cowl above an aircraft instrument panel. The device is held in place on the face by spectacle temples and peripheral vision is excluded by flexible sideshields. Where individual corrective lenses are required, the proper prescription can be incorporated in the clear area of the device.

3,577,567
MODIFIED MULTI-PURPOSE BIDET
Andrew F. Wintercorn, 2449 Clinton Road, Rockford, Ill.
Filed Oct. 14, 1968, Ser. No. 767,227
Int. Cl. A47k *3/22*
U.S. Cl. 4—7 **15 Claims**



The device in both forms may be used with an adapter attached to the mixing faucet on a lavatory or bathtub, or may be connected permanently or semipermanently with a mixing valve that has connections with the hot and cold water valves under a lavatory. In either event, the basin has its flange resting on the toilet bowl for support and is provided with a substantially central upwardly directed spray nozzle to which water of the desired temperature is delivered normally when a spring closed valve on the rear flange is automatically opened by the operator sitting on the basin, the flow being controllable by the user leaning forward, more or less, to relieve pressure on the rear portion, which is an especially important feature when a douche or enema nozzle is being used in lieu of the ordinary bidet nozzle. Jet sprays around the rim of the basin to which water is delivered continuously independently of the automatic valve, serve for rinsing purposes and also for temperature testing, while the flow to these jets warms up the rim of the basin for better comfort prior to the operator sitting on the basin. In the combination bidet and sitzbath the basin is somewhat deeper, and, in addition to the holes provided in the bottom around the nozzle for drainage, there are overflow holes provided in the sidewalls of the basin near the top in circumferentially spaced relation between the jet openings, and one may, by shutting off flow through the bottom drain holes, trap sufficient water in the basin for sitzbath operation. Medication may be added by passing the incoming warm water through a container for the medication, that is transparent so that one can tell immediately when the medication is used up.

3,577,568
WATER CLOSET
Ole Bjerke Johansen, Asmundtorp 147, S-430 61, Harryda, and Jan Ove Hertil Herveus, Nygardsvagen 18 D, S-433 00, Partille, Sweden
Filed Oct. 10, 1969, Ser. No. 865,538
Int. Cl. E03d *5/016*
U.S. Cl. 4—77 **4 Claims**

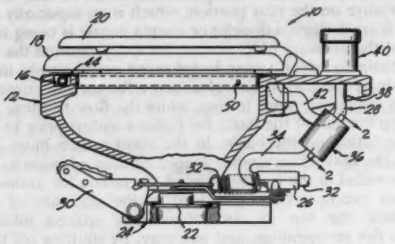


A water closet using a very limited amount of flushing water owing to recirculation of the same by means of a pump system. The flushing liquid receptacle is positioned beneath the closet bowl and through said receptacle extends in the vertical direction a discharge pipe which at its lower end opens into a sludge tank and which has its upper end positioned vertically below the lower opening of the closet bowl. A disclike valve is adapted to provide preferably airtight sealing of the upper end of the discharge pipe.

3,577,569
TOILET APPARATUS
Ronald J. Sargent, Ann Arbor; Charles L. Sargent, Ypsilanti; Frank T. Sargent, Clio, and John A. Hoffman, Brighton, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.
Filed Mar. 21, 1969, Ser. No. 809,225
Int. Cl. E03d *11/10, 11/08*
U.S. Cl. 4—79 **11 Claims**

A toilet having a flushing apparatus whereby a fixed

volume of water is discharged from a single nozzle into the

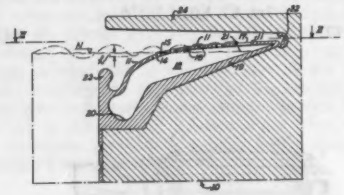


bowl of the toilet in a vortex pattern.

3,577,570
SWIMMING POOLS

Georges Vincent, Grenoble, France, assignor to Societe Grenobloise d—Etudes et d'—Applications Hydrauliques (Sogreah), Grenoble, France

Filed Mar. 8, 1968, Ser. No. 711,628
Claims priority, application France, Mar. 8, 1967, 5070
Int. Cl. E04h *3/18*
U.S. Cl. 4—172.17 **12 Claims**

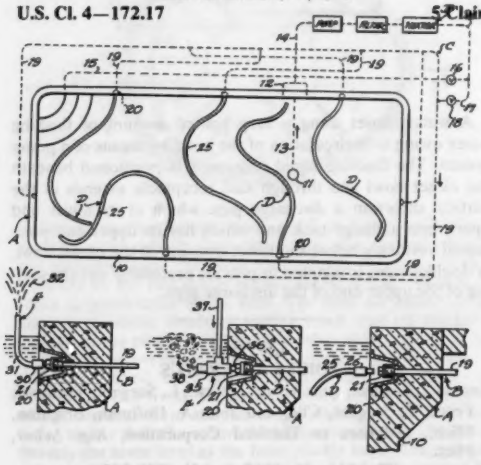


The swimming pool is provided with edges having a gentle slope with respect to the static water surface in the pool so that wave reflection from the edges of the pool is eliminated.

3,577,571
COMBINATION CLEANING, FOUNTAIN AND THERAPEUTIC WHIRLPOOL APPARATUS FOR SWIMMING POOLS

Bernard Bellinson, Sherman Oaks, and Henry R. Young, Arleta, Calif., assignors to Marine Swimming Pool Equipment Co., North Hollywood, Calif.

Filed Mar. 19, 1969, Ser. No. 808,630
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.17 **5 Claims**

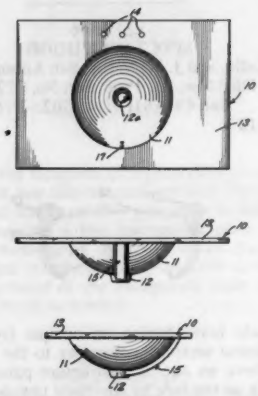


A swimming pool having in its sidewall a plurality of water-delivery outlet sockets; in combination with selectively attachable cleaning hoses of the jet-propelled type, fountain heads for converting the water flow into a series of fountain sprays during nonuse of the cleaner hoses, and therapeutic jet nozzles for converting the flow into a water and air bubble mixture for "whirlpool" agitation of the water.

3,577,572
INTEGRAL LAVATORY BOWL AND VANITY TOP COMBINATION

Kay L. Ruggles; Dale B. Gunnerson, and Howard S. Clark, Salt Lake City, Utah, assignors to American Standard, Inc., New York, N.Y.

Division of Ser. No. 606,324 Dec. 30, 1966, Pat. No. 3,433,860. Filed Jan. 21, 1969, Ser. No. 872,779
Int. Cl. E03c *1/18;* **A47k** *1/04*
U.S. Cl. 4—187 **6 Claims**

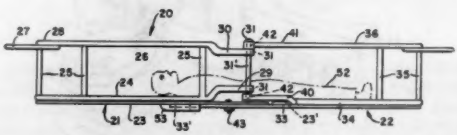


The Article of Manufacture comprises an integral lavatory bowl and vanity top combination of a thermosetting synthetic plastic composition, preferably of the polyester resin type, wherein the bowl area is integrally formed with the vanity top area. The bowl area may be provided with a preformed overflow tube which is embedded within the material of the sidewall of the bowl.

3,577,573
AMBULANCE STRETCHER DEVICE

Wencle J. Mrnak, Bowman, N. Dak.

Filed Feb. 14, 1969, Ser. No. 799,346
Int. Cl. A47b *83/04*
U.S. Cl. 5—82 **2 Claims**



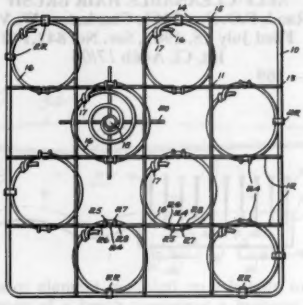
The invention comprises an ambulance stretcher having a pair of sections with bottom support plate members in each section disposed in horizontal planes, said bottom support members having their inner edges overlapping in flush relationship to one another, a pin pivotally connecting said bottom members together along their overlapping portions whereby one section may be pivoted relative to the other section in a horizontal direction to facilitate transporting the stretcher about sharp corners.

3,577,574

SPRING ASSEMBLY FOR FURNITURE AND METHOD OF MANUFACTURE

Fred A. Ciampa; Angelo Serafini, and Louis Mazzarella, Boston, Mass., assignors to Standard Box Spring Co., East Boston, Mass.

Filed Jan. 3, 1969, Ser. No. 788,893
Int. Cl. A61j 19/00
U.S. Cl. 5—267 6 Claims



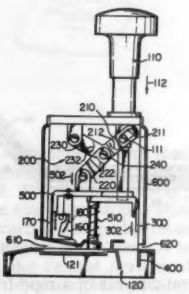
A spring assembly for bed springs or other furniture is prepared from wires having a series of longitudinally spaced return bends. Two groups of wires are welded in right angular relation to form a planar wire mesh. The return bends are located in at least one group of the wires, and form pairs of channels which are open in a direction normal to the plane of the mesh. The mesh is inverted with the channels open upwardly, and a number of coil springs are positioned on it, with the upper convolution of a coil spring inserted into each pair of channels. The return bends are then bent over the convolutions to lock them to the mesh. The free ends of the springs of the resulting spring assembly are then attached to a frame in a conventional manner.

3,577,575

BINDING AND OPENING DEVICE

Fumio Taniguchi, 2-3 Ueno-cho-3-chome, Tajimi-shi, Japan

Filed Feb. 28, 1969, Ser. No. 803,183
Claims priority, application Japan, Mar. 29, 1968, 43/20001
Int. Cl. B25b 27/14; B26b 27/00; B31f 5/02
U.S. Cl. 7—14.1 7 Claims



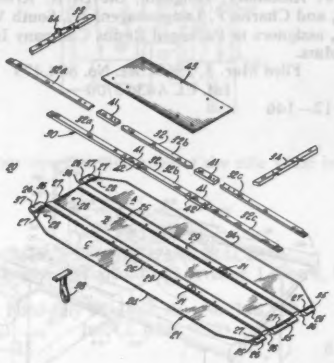
The binding device has a cutter for making a U-shaped slot in papers, a cam for bending down the U-shaped portion of the papers, and a knife for making an I-shaped slot in the papers and for inserting the portion into the I-shaped slot. The binding and opening device has a plurality of sets of the cutter, cam, and knife and further has a pair of edges for opening a letter.

3,577,576

COLLAPSIBLE SURFBOARD OR SAILBOAT

Edward Vernon Lobb, Port Murray, N.J., and Raymond W. Coburn, Jr., New York, N.Y., assignors to Colgil Enterprises, Inc., Oyster Bay Cove, N.Y.

Filed June 24, 1969, Ser. No. 836,115
Int. Cl. B63b 7/00, 35/00
U.S. Cl. 9—2A 9 Claims



The present invention relates to a collapsible vessel having an inflatable hull which is suitable for use as a surfboard or sailboat. The inflatable hull is formed of a flexible sheet material such as polyvinyl chloride and incorporates inflatable air and watertight compartments therein which are interconnected by chambers or pockets to receive and hold rigid reinforcing elements in place relative to the hull.

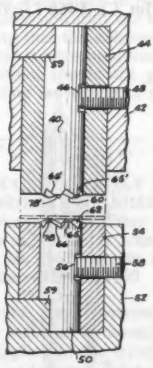
The reinforcing elements extend lengthwise of the hull and may be interconnected by crossmembers to form a rigid reinforcing frame. Both the hull and the reinforcing elements are collapsible for purposes of transportation and storage. Components which enable the hull to be utilized as a sailboat are attached to and are supported by elements of the reinforcing frame.

3,577,577

LOCK WASHER

Alfred M. Zak, 6110 Casmere Ave., Detroit, Mich.

Filed May 13, 1969, Ser. No. 824,192
Int. Cl. B21d 53/20
U.S. Cl. 10—73 12 Claims



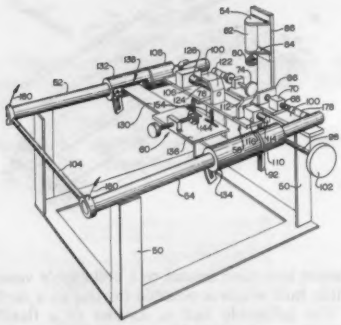
An electrical connector formed with a lock washer portion having a plurality of inwardly extending locking tabs. Each tab is formed into a bent configuration between a punch and

die which are so shaped that each tab remains integrally connected throughout its circumferential extent with the body portion of the lock washer section by a bend line with one side edge portion of each tab projecting above and the other below the plane of the body portion of the washer.

3,577,578
SHOE LAST REMODELING JIG

Arthur P. Alexander, Hingham; Steven R. Aronson, Mattapan, and Charles F. Langenhagen, Jr., South Weymouth, Mass., assignors to Packaged Resins Company Inc., Braintree, Mass.

Filed Mar. 5, 1969, Ser. No. 804,479
Int. Cl. A43d *3/00*
U.S. Cl. 12—146 **27 Claims**

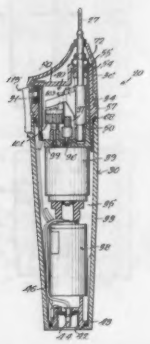


A method and apparatus for fitting, in predetermined registration, a mold cap to the toe end of a last which is supported in a predetermined position and orientation. Gauges, adapted to contact the last at predetermined locations about its bottom pattern, are adjustable to the particular bottom pattern to insure that successive lasts of the same size and style will be supported in the same position and orientation. A mold cap gauge supported is also provided to support successive mold caps repetitively in the same orientation with respect to that of the supported last. The last and mold caps are then combined while in their respective, proper orientations to insure proper and uniform registration.

3,577,579
ELECTRIC TOOTHBRUSH

John P. Duve, 8625 Parkview Ave., Brookfield, Ill., and Douglas E. Beck, 3001 S. King Drive, Chicago, Ill.

Division of Ser. No. 824,110, May 13, 1969, filed Oct. 29, 1969, Ser. No. 872,255
Int. Cl. A46b *13/00*
U.S. Cl. 15—22 **12 Claims**

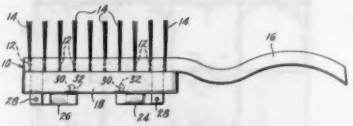


An electric cordless toothbrushing device having a power handle with a drive shaft extending from one end thereof and a toothbrush attachment which is securable to the remote end of said shaft. The power handle includes a battery-powered motor which by means of a motion-converting mechanism drives the shaft so that the rotary power of the motor is translated to an orbital motion at the toothbrush attachment. An improved electric switch is provided to control the energization of the motor.

3,577,580
SELF-CLEANABLE HAIR BRUSH

Robert B. Rand, P.O. Box 2461, Charleston, W. Va.

Filed July 18, 1969, Ser. No. 842,140
Int. Cl. A46b *17/06*
U.S. Cl. 15—169 **2 Claims**

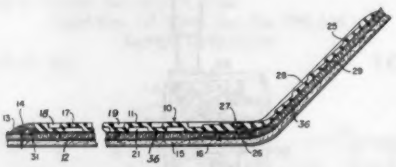


A self-cleanable hair brush comprising a main body portion having a handle at one end, a back normally disposed in contact with one side of said main body portion, tufts of bristles secured to said back and extending through openings in said body portion, a plurality of pins rigidly secured to said body portion and normally extending through apertures provided in said back, and a U-shaped clip member pivotally secured to each pair of pins, said clip members in normal operative position of the brush being secured to the upper side of said brush, and said clip members being pivotable to a position in which the legs of the U are in alignment with said pins whereby said back and said body member may be moved away from each other to a brush cleaning position in which the crossmembers of the U-shaped clip members constitute abutments limiting movement so that the back does not become disengaged from the tufts of bristles.

3,577,581
SHOE SCRAPER FLOOR GRATINGS FOR AUTOMOBILE FLOORS

Stanley S. Stata, Rockford, Ill., assignor to Andrew F. Winterconn, Rockford, Ill., fractional part interest to each

Filed July 17, 1969, Ser. No. 842,605
Int. Cl. B62d *25/20;* **B60n** *3/06*
U.S. Cl. 15—215 **13 Claims**

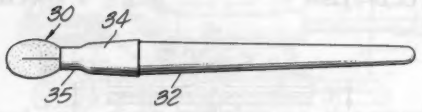


This vehicle floor mat consists of a rigid frame secured to the floor, and a mat of flexible material including a pan having a shoe scraper means therein, whereby dirt and moisture scraped from shoes is retained in the pan, and interfitting portions on the marginal edge portions of the pan and in the frame providing for detachably securing the pan in the frame against displacement from its position on the carpet these portions being designed to have a snap fit. A front cross portion on the frame in one form underlies the junction of a toeboard extension with the pan so as to allow free drainage of moisture from the toeboard extension into the pan over this cross portion.

3,577,582
METHOD OF MAKING AN APPLICATOR FOR COSMETICS

Bruno D. Aston, 14211 Skyline Drive, Hacienda Heights, Calif.

Continuation of application Ser. No. 660,124, Aug. 11, 1967, now abandoned. This application Apr. 11, 1969, Ser. No. 816,183
Int. Cl. A47k 7/02
U.S. Cl. 15—244 4 Claims

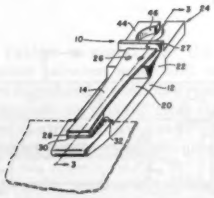


An applicator element mounted on a handle to serve the general purpose of a brush comprises a bulbous body of a soft, resilient, foamed plastic with the cells open to provide communication among the cells and to provide numerous minute outwardly open cavities formed by the outer cells. The applicator element is of folded construction. Preferably, a stiffener element is enclosed by the foamed plastic applicator element and is substantially smaller in cross-sectional area than the applicator element.

3,577,583
MAGNETIC CLAMP

Willard R. Amann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1968, Ser. No. 780,016
Int. Cl. E05d 13/02
U.S. Cl. 16—87.2 9 Claims



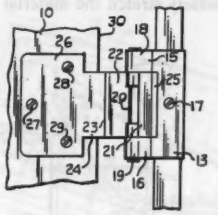
A clamp for releasably holding sheet material includes a rigid base of nonmagnetic material and an elongated strip of flexible material. The base carries a permanent magnet at one end, and the elongated strip is attached to the other end of the base and carries a second permanent magnet overlying the permanent magnet in the base. A recess is formed in the base underlying the central portion of the strip in such a manner that, by depressing that portion of the strip, the magnets are caused to part permitting insertion or removal of a piece of sheet material.

3,577,584
HINGE FOR CABINET DOOR

Louis E. Himelreich, Louisville, Ky., assignor to H. J. Scheirich Company, Louisville, Ky.

Filed July 22, 1969, Ser. No. 843,703
Int. Cl. E05d 5/06
U.S. Cl. 16—135 2 Claims

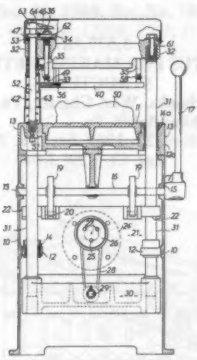
A hinge for mounting a door on a cabinet stile requires only a single-mounting fastening entering the stile and is illustrated with respect to a stile formed of folded material and having a door overlying the edge of the stile while in closed position.



3,577,585
MEAT-TENDERIZING MACHINE

Fernand Stanislas Allinquant, 53 Avenue LeNotre, Sceaux, France

Filed July 18, 1968, Ser. No. 745,758
Int. Cl. A22c 9/00
U.S. Cl. 17—25 8 Claims



The invention relates to a meat-tenderizing machine comprising stationary columns, a grid pressing upon the piece of meat which, owing to inclined hinged rings rubbing against the columns, should be maintained in position while the tenderizing blades are pulled upwardly out of the piece of meat, the improvement being that the columns bear at these tops owing to which the grid is prevented from ascending beyond a given topmost position, should the grid accompany the blades in their ascending movement in spite of the inclined rings.

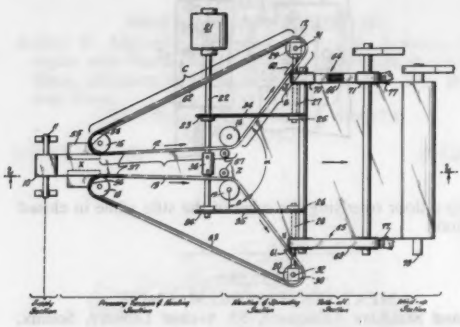
3,577,586
APPARATUS FOR CONTINUOUSLY TRANSVERSELY STRETCHING ORIENTABLE SHEET MATERIAL

Frank Kalwaites, Somerville, and Peter L. Doviak, Kendall Park, N.J., assignors to Johnson & Johnson

Filed Dec. 20, 1967, Ser. No. 692,006
Int. Cl. B29g 7/00
U.S. Cl. 18—1 8 Claims

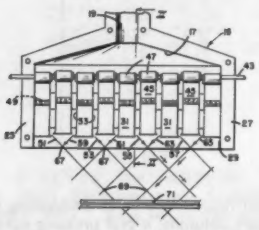
Method and apparatus for transversely stretching sheet material wherein the material is moved in its longitudinal direction, tension is applied in the transverse direction, the material heated and uniformly stretched in its transverse direction at a rate sufficient to orient the material. After the material is uniformly transversely stretched the desired amount the edges of the material are kept parallel and the material cooled. The apparatus comprises means for applying tension in the transverse direction of continuously moving sheet material, means for heating the material while said ten-

sion is applied, a pair of diverging conveyors which diverge at an angle greater than 40°, the diverging conveyors having clamping means which clamp the edges of the material to uniformly transversely stretch the material as the conveyors



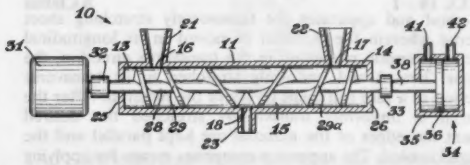
diverge and means for removing the continuously moving sheet material from the clamping means of the diverging conveyors while maintaining the edges of the material substantially parallel and under control.

3,577,587
APPARATUS FOR MAKING RETICULATED STRUCTURES
Theodore H. Fairbanks, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Filed Nov. 22, 1968, Ser. No. 778,134
Int. Cl. B29f 3/04
U.S. Cl. 18—12 **7 Claims**



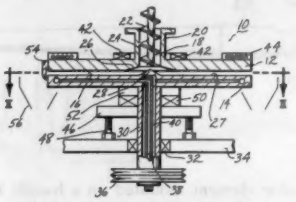
Apparatus for making reticulated structures by periodically contacting adjacent streams of a series of generally like streams of flowable material as they are extruded along sinuous paths, and thereafter setting the extruded streams.

3,577,588
EXTRUSION APPARATUS
Douglas S. Chisholm, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed May 5, 1969, Ser. No. 821,827
Int. Cl. B29f 3/01
U.S. Cl. 18—12 **8 Claims**



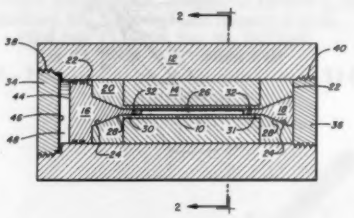
A screw having increasing lead or pitch is employed on an extruder with central feed or discharge to provide a self-balancing extrusion apparatus which does not require heavy thrust bearings.

3,577,589
APPARATUS FOR INCREASING THE DENSITY OF THERMOPLASTIC FOAM
Mario Serrano, and William D. Wolf, Simsbury, Conn., assignors to Monsanto Company, St. Louis, Mo.
Division of Ser. No. 705,443, Fev. 14, 1968, abandoned. Filed Mar. 12, 1969, Ser. No. 827,081
Int. Cl. B29f 3/02
U.S. Cl. 18—125M **4 Claims**



A method and apparatus for densifying thermoplastic foam wherein the foam cells are crushed by mulling within a narrow chamber formed by plates or members mounted for relative rotation with respect to each other. The densified foam emerges as a high density curdlike extrudate at the periphery of the members.

3,577,590
HIGH-PRESSURE CHAMBER
Victor C. D. Dawson, Silver Spring, and Arnold E. Seigel, Chevy Chase, Md.
Filed June 27, 1968, Ser. No. 740,606
Int. Cl. B29c 3/00
U.S. Cl. 18—16.5 **3 Claims**

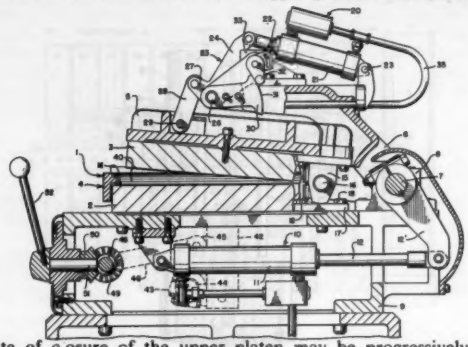


A high-pressure chamber having an inner tubular member circumscribed by a concentric outer tubular member of fully autofrettaged fabrication with a segmented circumferentially complete cylinder of high compressive strength material extending between the inner and outer tubular members.

3,577,591
FLAT BED TYPE CASTING MACHINE IMPROVEMENTS
Charles L. Ricards, South Plainfield, and Daniel McColley, Plainfield, N.J., assignors to Wood Industries, Inc., Plainfield, N.J.
Filed Mar. 29, 1968, Ser. No. 718,027
Int. Cl. B29h 5/00
U.S. Cl. 18—17 **6 Claims**

A casting machine for casting thin plastic articles having a flat lower platen and a moveable upper platen closing with

the lower platen with a clamshell motion and having fluid motor means associated with the upper platen whereby the



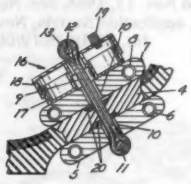
rate of closure of the upper platen may be progressively varied. A floating clamping frame associated with the lower platen for securing a matrix to the lower platen.

3,577,592

APPARATUS FOR REPAIRING TIRE CASINGS

Benjamin Whittle, R.R. #3, Paw Paw, Mich.

Filed Jan. 10, 1969, Ser. No. 790,198
Int. Cl. B29h *5/16*
U.S. Cl. 18—18 **6 Claims**



Flexible plug rubber is cured into the void formed by retaining the rubber between inner and outer plates, while holding the plates together by tension strands passed through the casing. The strands are cut off after the plug is set. The strands may pass centrally through the void and the plug material, or in spaced relation through uninjured parts of the casing.

A variation shows the tension strand also passing through an inner patch so that the patch is attached to the inside of the casing at the same time that the plug rubber is cured in place.

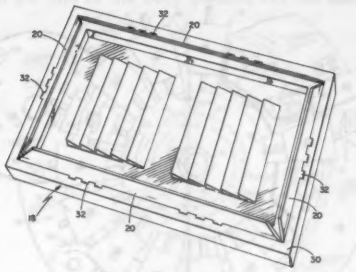
3,577,593

APPARATUS FOR HEAT AND VACUUM-PRESSURE MACHINE MOLDING

James W. Jackson, East Walpole, Mass., assignor to Bird & Son, Inc., East Walpole, Mass.

Filed Oct. 29, 1968, Ser. No. 771,576
Int. Cl. B29c *17/04, 23/00*
U.S. Cl. 18—19 **7 Claims**

Apparatus and methods for heat and vacuum-pressure machine molding of hollow articles from thermoplastic sheet material, involving a mold (normally with alternate vacuum and air pressure sources) having one or more relatively movable complementary molding members for forming undercut, reverse band, flanged or reentrant portions of said articles, with said member or members being mounted for relative movement, with respect to the molding surface of the mold, into molding position, and thereafter out of such molding position so that a molded article may be freely removed from said mold, said complementary molding member or members being preferably actuated by or through contact with and relative movement of the plastic sheet material by



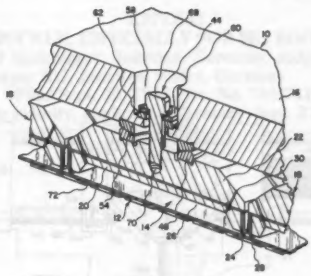
vacuum, with or without the aid of a plug-assist, e.g. where a female external mold is employed.

3,577,594

APPARATUS FOR FORMING HOLLOW ARTICLES

John D. Al-Roy, Union City, N.J., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1968, Ser. No. 787,840
Int. Cl. B29c *17/04, 3/02, 1/16*
U.S. Cl. 18—19 **8 Claims**



Apparatus for thermoforming synthetic plastic sheet material into hollow articles includes a platen member providing a rigid surface and a mold member having the desired cavity and a cutting blade edge. The two members are movable relative to each other and one of the members is mounted for pivotal movement relative to the other about the axis of movement of the movable member so as to accommodate misalignment of the two members.

3,577,595

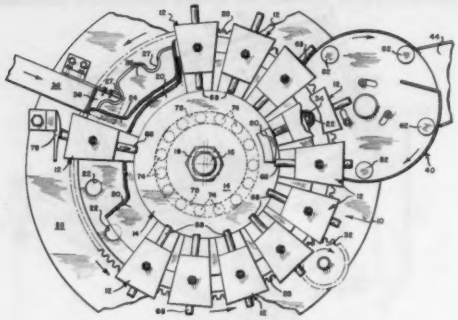
ROTATABLE CROWN-FILLING MACHINE AND METHOD FOR APPLYING SEALING RINGS OF PLASTIC TO THE PERIPHERY OF THE CROWN INTERIOR

Donald C. Smith, Pottsville, and Robert E. Koshada, Orwigsburg, Pa., assignors to Zapata Industries, Inc., Frackville, Pa.

Filed Aug. 26, 1968, Ser. No. 755,244
Int. Cl. B29c *3/00*
U.S. Cl. 18—20 **9 Claims**

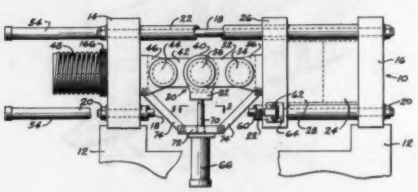
A machine for forming sealing rings in container closures comprising a rotatable-type carrier having a multiplicity of locations for receiving closures to be provided with sealing rings, means at each location for supplying a stream of fluid gasket-forming material to the peripheral portion of each closure at each location, means for rotating each closure on its axis a plurality of times during the supply of said stream thereto and means for controlling the delivery of said stream

of gasket material to each closure on the carrier while it is rotating a predetermined plurality of times, so that a ring of



gasket material of substantially uniform dimensions throughout is deposited in each closure.

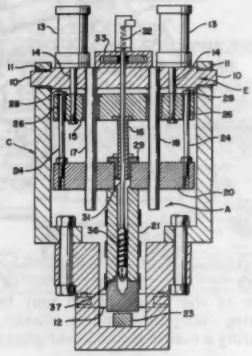
3,577,596
TWO-PHASE MOLD PRESS
Calvin P. Bullard, East Longmeadow, and Francis P. Szubelick, Springfield, Mass., assignors to Vigeant Gaston, East Longmeadow, Mass., a fractional part interest
Filed June 26, 1968, Ser. No. 740,179
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **10 Claims**



A two-stage power-operated press for closing molds as used in the manufacture of plastic articles by injection molding. The press incorporates a first fluid motor means for advancing and retracting the movable platen at a rapid traverse rate at relatively low pressure and a second fluid motor means for imparting a high-locking pressure to the movable platen at the end of its stroke in order to close the mating mold segments carried by the movable and fixed platens, respectively. The arrangement of the operating parts of the press is such as to achieve maximum platen stroke in order to obtain increased mold opening for accommodating molds for the manufacture of deep-draw articles.

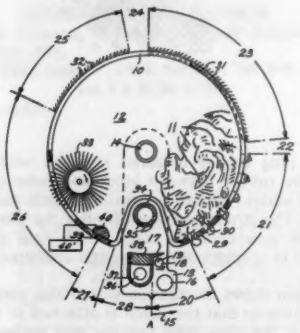
3,577,597
SUPPORT FOR INJECTION-MOLDING MACHINE
Donald A. Draudt, 27180 Pompton Drive, and Herbert T. Draudt, 28520 Lynhaven, North Olmsted, Ohio
Continuation-in-part of application Ser. No. 551,386, May 19, 1966, now Patent No. 3,406,429. This application Sept. 20, 1968, Ser. No. 761,095
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **4 Claims**

Apparatus for molding articles from thermoplastics wherein the moldable plastic material is plasticized and injected into a mold cavity. The plasticizing and injecting unit is pivotally mounted in a frame fixed relative to the mold and



the unit may be released at one end of the frame and swung away from the mold to facilitate cleaning.

3,577,598
APPARATUS FOR THE AUTOMATIC DETERMINATION OF FIBER LENGTH DISTRIBUTION OF A FIBER POPULATION
Eric Schwarz, 9 Hochstrasse 8044, Zurich, Switzerland
Filed Nov. 13, 1968, Ser. No. 775,411
Claims priority, application Austria, Nov. 17, 1967, 10373/67
Int. Cl. D01h *19/00*
U.S. Cl. 19—65 **9 Claims**

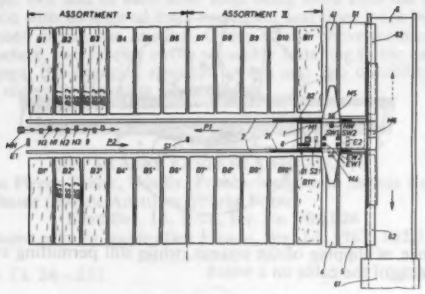


A drum containing fibers has a perforated wall portion swept exteriorly by a comb which picks up protruding fibers and forms a beard. Carding means on a successive wall portion is swept by the comb to parallelize the fibers in the beard. The comb sweeps past another successive wall portion where the beard is scanned optically to develop electric signals which are a function of the fibers in the beard. The beard is removed as the comb sweeps past another successive wall portion. Whereupon the cycle can be repeated.

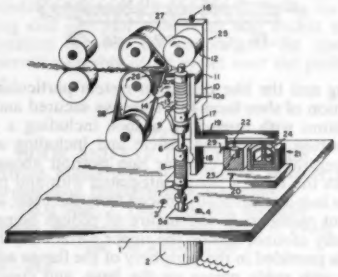
3,577,599
APPARATUS FOR MIXING FIBROUS COMPONENTS
Georg Goldammer, Ingolstadt, and Gunther Mahrt, Etting, Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany
Filed Jan. 16, 1969, Ser. No. 792,234
Int. Cl. D01g *13/00*
U.S. Cl. 19—145.5 **7 Claims**

The invention relates to a process for the accurate mixing

of fibrous components in a predetermined ratio, and to apparatus for the performance of the process.



3,577,600
APPARATUS FOR RAPID AUTOMATED MEASUREMENT OF DRAFTING FORCE AND DRAFTING FORCE VARIABILITY
John S. Graham, Clemson, S.C.
Filed Sept. 26, 1968, Ser. No. 762,951
Int. Cl. D01h *5/18*
U.S. Cl. 19—293 **1 Claim**

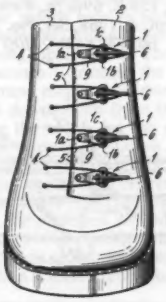


An apparatus for measuring the drafting force and drafting force variability in conventional drafting systems. The force sensing assembly together with the drafting rolls and the associated roll driving mechanism of the apparatus are oscillatingly supported on a resilient directionally restricted pivot, so that drafting force is transformed into bending movement which movement causes angular displacement of the assembly around the resilient pivot as a center. Force measurement is accomplished via an electronic strain gauge. The electrical signals generated by the strain gauge are employed as analogs of drafting force and drafting force variability and accordingly analyzed automatically or semiautomatically.

3,577,601
ARTICLE FASTENING DEVICE
Remo Mariani, Berkeley Heights, and George H. Geisinger, Union County, N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Mar. 12, 1969, Ser. No. 806,369
Int. Cl. B65d *63/00;* **A61b** *17/08*
U.S. Cl. 24—16 **11 Claims**

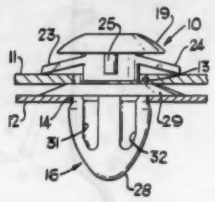
The disclosure is directed to a device for fastening two or more articles together and which does not require threading apertures. The device is constructed of a generally elongated flexible body portion terminating at a first end in a head member having a transverse aperture therein to permit passage of the body portion therethrough. The opposite end of the body portion terminates in a substantially rigid tail end portion having thereon a cutting edge such as a point. The tail end portion is generally formed in an arcuate manner to facilitate its being returned through the article once it has been inserted therein. The tail end portion may be provided in one of three ways; (1) a preformed metallic member is joined to the end of the body portion; (2) the end of the body portion is cold worked or otherwise treated in order to increase its physical strength and rigidity; or (3) the cold worked, or treated, tail end portion is plated with a metallic plating. Additionally the plated tail end portion may be cold worked to further increase its strength and rigidity.

3,577,602
BUCKLE, ESPECIALLY FOR SKI BOOTS
Ferdinand Speichinger, Jestetten, Germany, assignor to Karl Altenburger KG, Jestetten, Baden, Germany
Filed Sept. 23, 1968, Ser. No. 761,741
Claims priority, application Germany, Sept. 27, 1967, P 16 85 786.6
Int. Cl. A43c *11/14*
U.S. Cl. 24—70 **1 Claim**



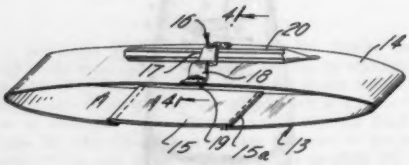
A shoe buckle, especially for ski boots, which includes: an approximately triangular plate, and bearing means connected to said plate and having a substantially U-shaped contour, said bearing means comprising two-spaced supporting members at least approximately perpendicular to the respective adjacent major surfaces of said plate and provided with axially aligned bores for receiving a pivot pin, said bearing means also comprising a flat arm integral with said supporting members and forming the transverse arm of said U-shaped contour, said flat arm being spot-welded to said plate at an area thereof which is wider than the length of said flat arm.

3,577,603
FASTENER
Clifford Alexander Seckerson, Iver Heath, and Robert C. Collyer, Harefield, England, assignors to United-Carr Incorporated, Boston, Mass.
Filed Sept. 29, 1969, Ser. No. 861,749
Claims priority, application Great Britain, Oct. 2, 1968, Oct. 22, 1968, Nov. 11, 1968, June 27, 1969, 46829/68;50022/68;5322568;32682/69
Int. Cl. F16b 21/00; A44b 21/00
U.S. Cl. 24—73 13 Claims



A two-part fastener for attaching two apertured panels together so that one panel is readily removable from the other, the fastener comprising a stud portion having a shank adapted for snap engagement rough a circular aperture in one of the panels, a flange at one end of the shank adapted to abut the outer surface of the said one panel to limit insertion of the shank therethrough and a stud projecting from the opposite side of the flange from the shank and adapted to project outwardly through a circular aperture in the other panel when the other panel is resting on the flange of the stud portion and a socket portion formed with a bore open at one end shaped to receive the stud of the stud portion and with an external flange which is spaced from the said one end of the bore and adapted to clamp the said other panel against the said flange of the stud portion, the stud and the bore in the socket portion being provided with means which interengage when the stud is within the bore to resist withdrawal of the socket portion from the stud.

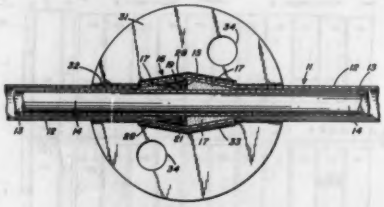
3,577,604
WRITING IMPLEMENT HOLDER FOR BOOKS OR LIKE ARTICLES
Jeffrey Owen Brosk, 150 E. 69th St., New York, N.Y.
Filed Sept. 4, 1968, Ser. No. 757,432
Int. Cl. A44b 21/00
U.S. Cl. 24—81 5 Claims



An elastic holder for writing implements adapted to encompass a book and capable of use as a bookmark.

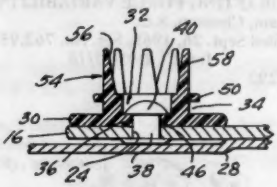
3,577,605
TOW CABLE TERMINATION
Raymond C. Fischer, Severna Park, and Norton J. Levenson, Baltimore, Md.
Filed Mar. 25, 1969, Ser. No. 810,268
Int. Cl. F16g 11/00
U.S. Cl. 24—114.5 2 Claims

This invention is concerned with a termination to be applied to a double stranded counterwound electromechanical tow cable. By the insertion of a wedgelike member between the strands a hump is built into the cable which may be gripped at the point of the hump by a split tow ball without



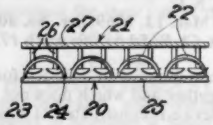
chance of slipping of the strands, while still permitting even winding of the cable on a winch.

3,577,606
STRING AND THE LIKE DETENTION SYSTEM
Cyril M. Tyrrell, Sr., 13 Kaden Court, Novato, Calif.
Filed Feb. 28, 1969, Ser. No. 810,081
Int. Cl. F16g 11/00
U.S. Cl. 24—117 10 Claims



A string and the like detention system particularly suited for detention of shoe laces in a selective secured and releasable condition with respect to a shoe including a spoollike lashing button fixed to an article and including a circular base, a centrally open circular hub portion above and integral with the base, a flange integrated with and positioned above the hub and vertically spaced from the base, a plurality of resilient members in the nature of prongs being secured peripherally around, and on the upper surface of, the flange, a recess is provided in the periphery of the flange adapted for coacting with guide means on the base, and constituting a guide for passage therethrough of an end of the string and the like, for subsequent winding of the string about the hub and the prongs, following insertion of a string end through the guide means on the base and the recess in the flange for releasable detention of a string end, release being effected by inward pressure on the resilient prongs to permit the wound string end to be vertically lifted from engagement with the prongs and subsequent removal from the button.

3,577,607
SEPARABLE FASTENING FABRIC
Yasaburo Ikoma, and Ikuta Yabu, Sumiyoshi-ku, Osaka, Japan, assignors to Ikoma Orimono Co., Ltd., Osaka, Japan
Filed June 13, 1968, Ser. No. 736,838
Claims priority, application Japan, June 19, 1967, 52414
Int. Cl. A44b 17/00
U.S. Cl. 24—204 6 Claims



A separable fastening fabric for engagement of a first and second fabric in face-to-face relation comprising a number of

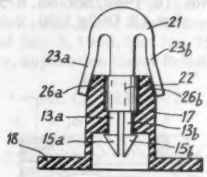
fiber loops in the shape of curved bridges outstanding from the first fabric and a number of engaging projections outstanding from the second fabric which engage to said fiber loops, two feet of each fiber loop being fixed onto the first fabric with an interval from each foot, said fiber loops being crossed zigzag one another. Owing to the above-mentioned structure, two fabrics of the separable fastening fabric easily engage, the engaging strength is high and also durability of the separable fastening fabric is long.

3,577,608

SEPARABLE FASTENER ELEMENTS

Jean Pierre Texier, Neuilly, France, assignor to Societe Gobin Daude (Societe Anonyme), Paris, France

Filed Dec. 16, 1968, Ser. No. 784,026
Claims priority, application France, Dec. 14, 1967, 132,317
Int. Cl. A44b *17/00*
U.S. Cl. 24—221 **2 Claims**



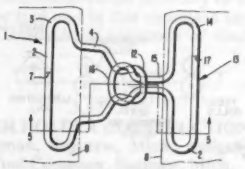
The device of this invention includes preformed plastic fastener elements, one of which includes a socket containing diametrically opposed rigid means disposed therewithin and the other including an operator which is assemblable into locking engagement with the rigid means, said operator including bendable bifurcated leg means including lock means for securing said operator relative to said socket to permit relative rotation between the socket and the operator in order to permit assembly of an eyelet over the perimeter of said socket.

3,577,609

HOOK AND EYE TYPE FASTENER

Franz Gottfried, Stolberg-Dorff, Germany, assignor to Firma Kurt Dorpinghaus, Huckeswagen, Germany

Filed Mar. 7, 1969, Ser. No. 805,256
Claims priority, application Germany, Mar. 8, 1968, D37699
Int. Cl. A44b *13/00*
U.S. Cl. 24—228 **1 Claim**



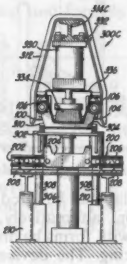
The fastener consists of interlocking hook and eye elements. The eye element comprises a closed loop of resilient wire. The loop is intended to form merging curved and stepped formations to provide an end portion which is secured to the fabric, and intermediate portion and an eye. The loop is further indented at the junction of the intermediate portion and eye to provide an opening of a given dimension. The hook element is also a closed loop having an end portion to be secured to the fabric, a neck portion slightly larger than the opening in the eye element, and a hook which can pass through the intermediate portion. The edge of the eye is angularly bent to the extent of the diameter of the wire. The neck is indented to a depth equal to the diameter of the wire. To close the fastener, the hook is inserted within the intermediate portion, and upon the closing movement, the neck spreads the opening to permit the neck and the hook to pass into the eye. The opening returns to its initial dimension, thereby retaining the parts in closed position. In the closed position, the bent edge lies within the indentation to permit the alignment of the elements to present a flat closure.

3,577,610

APPARATUS FOR MANUFACTURING PRESTRESSED CONCRETE MEMBERS

Stanley V. Margolin, Auburndale; Paul W. Glaser, Islington, and Leonard V. Gallagher, Wollaston, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 16, 1968, Ser. No. 721,834
Int. Cl. B28b *15/00, 23/06*
U.S. Cl. 25—2 **16 Claims**



A system for casting prestressed concrete members on a highly automated, mass production basis. The system employs a plurality of portable molds, each of which defines a hollow mold cavity. The portable molds are preferably substantially identical in construction, include open top portions through which charges of concrete mixture can be directed into the mold cavities, and further include means for releasably securing lengths of reinforcing strand in a selected arrangement within each mold cavity. Conveying means carry a plurality of molds simultaneously along a predetermined path of travel through operating stations adapted to subject each mold to a series of successive operations. A mold cleaning and oiling station cleans the interior surfaces of each mold cavity and coats the interior surfaces with a releasing agent. An placement station inserts hardware into the mold cavities, to be cast within the concrete members. A strand placement station emplaces predetermined lengths of reinforcing strand within the mode cavities, and a tensioning station applies a selected pretensioning force to the reinforcing strand. Filling and compacting stations successively feed a measured charge of concrete mixture into each of the molds and compact the concrete charge in the molds. Means are provided to cure the concrete charge within each of the molds after the filling and compacting operations are completed. Conveyor means receive and convey a plurality of the molds simultaneously along a predetermined path of travel after the curing operation is completed. A tension releasing station operates to release the pretensioning load on the reinforcing strand emplaced within each of the molds. Means are provided downstream from the tension releasing station for preparing the molds for the removal of the cast concrete members. A demolding station operates to remove the cast concrete member from each mold. Means are also provided to finish the demolded concrete members and to prepare the empty molds for recirculation through the manufacturing system. In the preferred embodiment each operating station is provided with a portable mold, and the operating stations perform their respective operations substantially simultaneously, within a selected time interval.

3,577,611

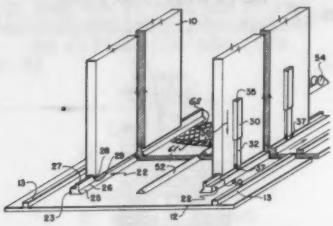
CONCRETE SLAB FORMING MACHINE WITH REMOVABLE SOFFIT EDGES

Frederick Maxwell Hewitt, Winnipeg, Manitoba, Canada, assignor to Spiroll Corporation, Ltd., Winnipeg, Manitoba, Canada

Filed July 28, 1967, Ser. No. 656,798
Claims priority, application Great Britain, Aug. 5, 1966, 35186/66
Int. Cl. B28b *7/00*
U.S. Cl. 25—41 **19 Claims**

This device is a removable soffit edge for forming accurate, smooth, lower corners to a concrete slab or the like being extruded or slip formed on a bed. It consists of an elongated form placed on the bed and engaged within a groove

on the underside of the side plates of the machine which maintains the parallel relationship of the forms as the machine passes thereover. These forms can be any desired shape and in fact can be extended to act as the sidewalls of a slab if it is desired that the side faces of the slab be accurately and smooth finished. After the slab has been formed and



cured sufficiently, the slab can be lifted from the bed leaving the forms in place or, alternatively, the forms can be removed and replaced with forms having a different configuration or different spacing. The device will also permit the use of a different soffit form as either the complete form itself may be replaced or a "liner," such as a plastic or rubber sheet, can be inserted underneath the soffit edges.

3,577,612

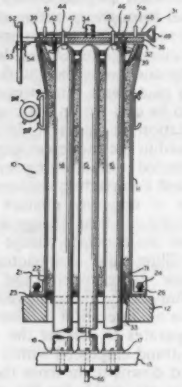
APPARATUS FOR MAKING MULTIDUCT CONDUIT

Victor G. Susin, 834 Santa Maria Drive, Naperville, Ill.

Filed Sept. 25, 1968, Ser. No. 763,494

Int. Cl. B28b *7/18, 7/28;* **B28b** *7/06*

U.S. Cl. 25—41 **11 Claims**



Improved pressure heads and platens for use in concrete conduit mold assemblies. The heads control flexible platens to make it possible to completely fill the end web sections of the molded conduit and nonetheless obviate concrete flashing.

3,577,613

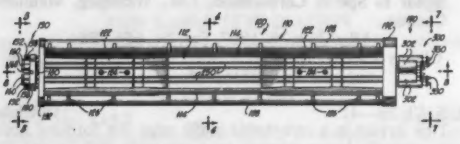
PORTABLE MOLDING APPARATUS

William P. Hidden, Wenham, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 16, 1968, Ser. No. 721,767

Int. Cl. B28b *7/00, 23/06*

U.S. Cl. 25—118 **11 Claims**



A portable molding apparatus for prestressed concrete members including a hollow mold body for receiving a charge of concrete and reinforcing strand for emplacement in the molded concrete. Mold end members, at least one of which is moveable, define opposite end portions of the body and include strand gripping means to receive and engage a portion of reinforcing strand to retain a strand suspended within the mold cavity. Releasing means provided on each end member are engageable with the gripping means to disengage the gripping means from the strand, and at least one of the end members is moveable with respect to the mold body with the releasing and gripping means engaged so that the strand can be withdrawn from the gripping means and the cast concrete member removed from the mold body.

3,577,614

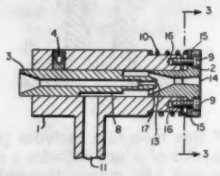
YARN-TEXTURING JET DEVICE

Samuel T. Price, Wilmington, Del., assignor to E. I. du Pont Nemours and Company, Wilmington, Del.

Filed Nov. 10, 1969, Ser. No. 875,093

Int. Cl. D02g *3/00*

U.S. Cl. 28—1.4 **6 Claims**



Improved fluid jet yarn-texturing devices have a nozzle portion which is moved to a stringup position for sucking a yarn end through the device and is then returned to a preset operating position for texturing the yarn when stringup has been completed.

3,577,615

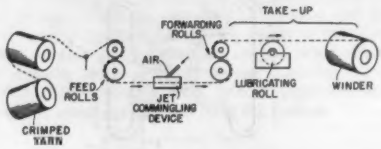
PROCESS FOR COMINGLING CRIMPED YARN

Fred W. LeNoir, Hopewell, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 535,480 Oct. 21, 1969, Pat. No. 3,473,315 filed June 11, 1969, Ser. No. 840,099

Int. Cl. D02q *1/16*

U.S. Cl. 28—72.12 **4 Claims**



A process is provided for commingling a crimped multifilament yarn in a tubular passageway wherein the yarn is maintained under a slight tension while being subjected to a stream of gas directed against said yarn at an angle whereby substantially all of said gas flows through the tubular passageway countercurrent to the travel of the yarn.

3,577,616

ARC DISCHARGE LAMPS

Kenneth Scott, and Dennis A. Ramsey, London, England, assignors to British Lighting Industries Limited, London, England

Filed Jan. 5, 1968, Ser. No. 696,023

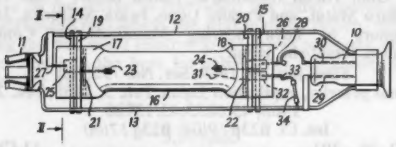
Claims priority, application Great Britain, Jan. 17, 1967, 2491/67

Int. Cl. H01j *9/18, 9/36*

U.S. Cl. 29—25.15 **5 Claims**

A method of mounting an arc tube, having pinch seals, between two parallel struts by using a staple having a bar

with two legs, passing the legs through the plane of the struts,



and binding the legs back around the struts to secure the arc tube thereto.

3,577,617

MACHINE TOOLS

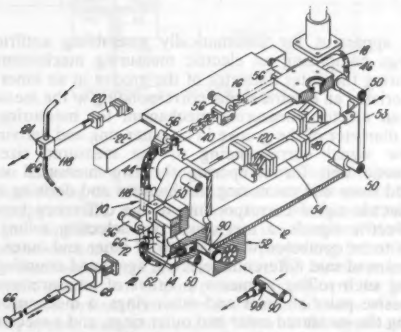
William Owen McKenzie Jones, Hurle, Berkshire, England

Filed July 3, 1968, Ser. No. 750,408

Claims priority, application Great Britain, July 12, 1967, 32032/67

Int. Cl. B23b *29/24*

U.S. Cl. 29—54 **10 Claims**



The invention relates to a tool-changing mechanism for use with machine tools and in particular with lathes. The mechanism comprises a conveyor which can carry an unspecified number of tools sequentially to a tool-receiving station at which they are located in order to perform a cutting operation. The tools are intended normally to be preset away from the machine tool and in this condition can be mounted on the conveyor ready for a sequence of machining operations.

3,577,618

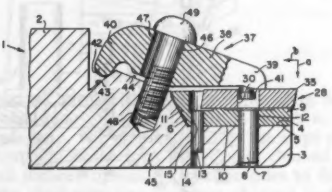
TOOLHOLDER CONSTRUCTION

Robert W. Cashman, Saginaw, Mich., assignor to Saginaw Machine and Tool Company, Saginaw, Mich.

Filed Aug. 19, 1968, Ser. No. 753,571

Int. Cl. B26d *1/00*

U.S. Cl. 29—96 **17 Claims**



A toolholder comprising an elongated body terminating at its forward end in a recess provided with a rearward arcuate wall and within which is mounted a correspondingly-shaped tool bit support having a pocket defined by a base and a pair of upstanding sides which converge both upwardly and rearwardly. A tool bit having a shape corresponding to the shape of the pocket is removably accommodated in the latter and is provided with a central opening for the reception of a lug formed on a clamp which overlies the tool bit and is anchored to the holder body. The clamp and the clamp anchor are so oriented with respect to the tool bit that anchoring of the clamp causes the latter to rock about a fulcrum in such manner as to urge the tool bit forcibly against the base of the pocket and forcibly against the sidewalls of the pocket.

3,577,619

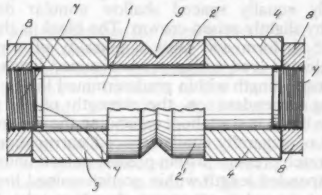
METHOD OF MANUFACTURING COMPOSITE HARDMETAL ROLLS

Per-Olof Strandel, Nasby Park, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden

Division of Ser. No. 614,227, Feb. 6, 1967, Pat. No. 3,461,527 this application May 12, 1969, Ser. No. 823,629

Int. Cl. B23p *11/00;* **B21b** *27/00, 31/08*

U.S. Cl. 29—148.4 **2 Claims**



A method for manufacturing working rolls for rolling mills of the type formed by a roll core with a roll ring attached to the core, the roll ring being made of some hard material, such as hard metal or ceramic material. The roll ring is mounted with a clearance fit on the heated roll core and is secured thereto by pressure means which act axially against only the flat end surfaces of the roll ring, the pressure means imparting to the roll ring the force necessary for fixing and prestressing the ring so that it is capable of withstanding the rolling forces.

3,577,620

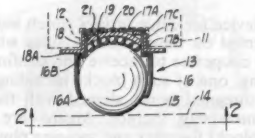
BALL CASTER AND METHOD MAKING THE SAME

George J. Hoffman, Northfield; William O. Setele, Independence, and Lester E. Law, North Royalton, Ohio, assignors to Kindale Industries, Inc., Independence, Ohio

Division of Ser. No. 774,031, Nov. 7, 1968, Pat. No. 3,514,804, June 2, 1970, this application Aug. 27, 1969, Ser. No. 853,445

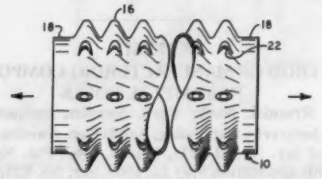
Int. Cl. B23p *11/00, 19/00*

U.S. Cl. 29—148.4A **3 Claims**



Method of assembling the caster parts and locking them in assembled condition of a ball-type caster.

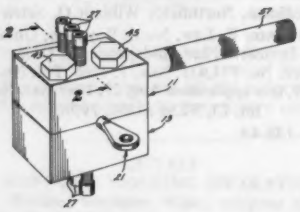
3,577,621
STRETCH METHOD FOR MAKING A TUBULAR PRODUCT
William J. De Gain, Warren, Mich., assignor to Koppy Tool Corporation, Ferndale, Mich.
Continuation-in-part of application Ser. No. 627,718, Apr. 3, 1967, now abandoned. This application May 14, 1969, Ser. No. 824,440
Int. Cl. B23p 17/00
U.S. Cl. 29—155 10 Claims



A tubular metal blank to be formed into a vehicle steering column or other corrugated tubular product is first deformed by radially inwardly moving dies to produce a plurality of substantially equally spaced shallow annular depressions separated by slightly raised crowns. The blank is then axially compressed to form and close a plurality of convolutions under a selected load within predetermined limits and to a selected closed length within predetermined limits, the variations being dependent on the strength of the material. Finally, the blank is stretched, expanding the convolutions to a plurality of generally similar spaced corrugations, with a selected stretch pressure within predetermined limits and to a selected expanded length within predetermined limits. If the end product is used as an energy-absorbing tube, the above method minimizes the variations in a selected compressive axial load required to collapse the finished column.

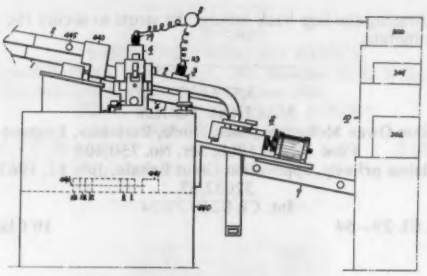
In another embodiment, a series of annularly spaced notches are cut in the convolutions after they have been compressed to abutting configuration to determine the hoop strains developed in the walls of the finished product corrugations when subjected to the axial collapse loading.

3,577,622
SWAGING DEVICE FOR CABLE FITTINGS
Frank E. Shaffer, P.O. Box 1546, Costa Mesa, Calif.
Filed Feb. 20, 1969, Ser. No. 801,070
Int. Cl. B23p 19/00
U.S. Cl. 29—200 11 Claims



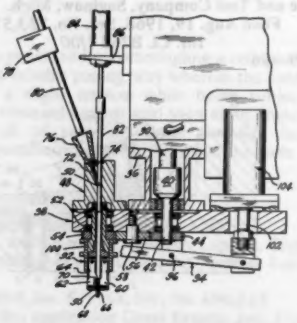
A swaging device for cable fittings which includes a pair of die blocks formed on their adjacent sides with confronting cavities which cooperate to receive and confine the shank of the cable fitting, one of such blocks including a plurality of pin-receiving threaded bores aligned with the cavities and projecting transversely thereof. Means are provided for fastening the blocks together and swaging pins are insertable into the passages whereby the shank of a cable fitting may be placed in the cavity, the blocks secured together, and the pins screwed inwardly in the passages to deform the wall of the shank inwardly to compress the cable while the shank is confined against undue flattening or radially outward deformation.

3,577,623
APPARATUS AND METHOD FOR AUTOMATICALLY ASSEMBLING ANTIFRICTION BEARINGS
Yosio Ono; Hirosi Nakamura; Takasi Inoue; Yosio Horie; Junitiro Matui, and Fumito Uono, Iwata, Shizuoka, Japan, assignors to Toyo Bearing Manufacturing Company Limited, Osaki-shi, Japan
Filed Jan. 30, 1969, Ser. No. 795,162
Claims priority, application Japan, Feb. 3, 1968, Feb. 24, 1968, 43/6853;43/13988
Int. Cl. B23p 19/04; B23g 17/00
U.S. Cl. 29—201 11 Claims



An apparatus for automatically assembling antifriction bearings comprising an electric measuring mechanism for measuring the outer diameter of the groove in an inner ring and deriving an electric signal corresponding to the measured size, an electric measuring mechanism for measuring the inner diameter of the groove in an outer ring and deriving an electric signal corresponding to the measured size, an arithmetic unit for comparing the two measured values derived from said measuring mechanisms and deriving a single electric signal corresponding to the difference between the electric signals, a mechanism for selecting rolling elements to be combined with the pair of inner and outer rings by means of said differential electric signal and counting and storing such rolling elements in order of measurements of successive pairs of inner and outer rings, a mechanism for pairing the measured inner and outer rings, and a mechanism for feeding the selected and counted rolling elements into the eccentric clearance between the thus paired inner and outer rings and incorporating a retainer therein, whereby antifriction bearings are automatically assembled by a series of operations of said mechanisms.

3,577,624
CENTER FEED DRIVER ASSEMBLY
Eugene E. Bentschneider, Manchester, Mich., assignor to Manchester Tool & Die, Inc., Manchester, Mich.
Filed Aug. 19, 1969, Ser. No. 851,317
Int. Cl. B23q 7/10
U.S. Cl. 29—211 11 Claims



Stud driving apparatus that includes a center feed driver which has a center bore into which studs can be fed singly, and a positioning rod which is movable in the bore relative to the driver for positioning the stud at one end of the driver.

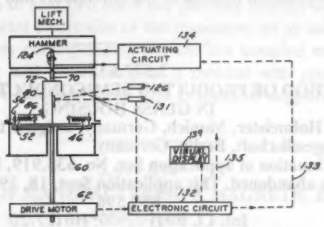
Spring actuated jaws are pivotally mounted in the driver for holding the first of the studs in a fixed position in the bore during the driving operation. The positioning rod is mounted relative to the driver so that when the latter moves toward the workpiece into which the stud is to be driven, the positioning rod will move relative to the driver to permit entry of a next stud into the bore for subsequent positioning by the positioning rod.

3,577,625

PROCESS AND MECHANISM FOR SETTING IGNITION DISTRIBUTOR CENTRIFUGAL ADVANCE

George M. Schiedel, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 27, 1969, Ser. No. 811,024
Int. Cl. F02p *17/00*
U.S. Cl. 29—407P **11 Claims**



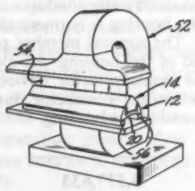
Tabs determining the amount of centrifugal advance are adjusted during distributor rotation at various speeds by applying appropriate hammer blows to a mechanism rotating with the distributor shaft assembly. The hammer blows are applied to concentric anvil members projecting from the top of the mechanism and are transmitted by members located within the mechanism to pins positioned adjacent the tabs. A photoelectric system senses the amount of advance at various rotating speeds and automatically controls the application of the hammer blows.

3,577,626

METHOD OF MAKING A TRIM MOLDING

Darl L. Link, Charlotte, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Feb. 6, 1969, Ser. No. 797,137
Int. Cl. B23p *9/00*
U.S. Cl. 29—445 **10 Claims**



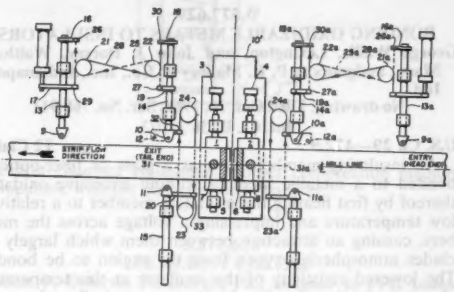
A method of manufacturing a trim molding having an anodized aluminum channel member in which is locked a vinyl bumper strip. The method includes the steps of extruding the aluminum in the form of an open channel with the bottom wall inclined upwardly from the sides to the center, inserting the vinyl strip into the open channel, and pressing down on the strip so that the bottom wall of the channel is flattened, causing the sides of the channel to close on the vinyl strip, thereby locking it in place in the channel. Appropriate buffing, anodizing of the aluminum, and cutting to length of the interlocked parts then follows. A product made according to the method is also disclosed.

3,577,627

METHOD AND APPARATUS FOR ALIGNING STRIP IN STRIP JOINING EQUIPMENT

Foster R. Woodward, Warren, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio

Filed Mar. 26, 1968, Ser. No. 716,116
Int. Cl. B23q *3/00*
U.S. Cl. 29—464 **10 Claims**



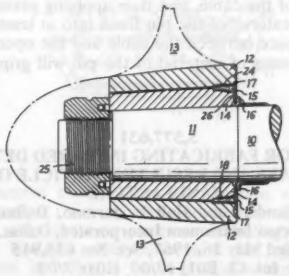
Method and apparatus for joining metal strip in general end-to-end relationship involving first aligning the strip lengths both transversely and angularly (to prevent dogleg) whereby the joint will be made so that the centerline of the strips will coincide with the longitudinal centerline of a machine. The control system includes, at each side of the joining means or welder, two sensors along one side of the strip which are interconnected by a sprocket and chain or equivalent means so that as one of the sensors follows the edge of the strip, the other will move correspondingly whereby both sensors will always be equidistant from the longitudinal centerline of the machine and one will control lateral movement of an auxiliary strip clamp to move the strip accordingly. A third sensor on the opposite side of the strip and of one of said sensor, and similarly linked thereto by a sprocket and chain or the like, is effective to control the main clamp to finally move the strip laterally so that its centerline will coincide with that of the machine. Similar controls are provided at the exit (tail end) and the entry (head end) of the machine. A fourth sensor control is optional to prevent the necessity of circuit switching.

3,577,628

MOUNTING OF PROPELLERS, IMPELLERS, WHEELS AND THE LIKE IN TORQUE AND THRUST TRANSMITTING CONNECTION ON SHAFTS

Thomas Walter Bunyan, London, England, assignor to P & O Pilgrim Valve Limited, London, England

Filed Feb. 27, 1969, Ser. No. 802,904
Claims priority, application Great Britain, Mar. 11, 1968, 11,816/68
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 **8 Claims**



A method of mounting a propeller, impeller, wheel or the like on a shaft with a separate metallic externally tapered

sleeve in torque and thrust transmitting connection on the shaft and force-fitted for torque and thrust transmitting connection in a correspondingly internally tapered hub of the member being mounted, in which a layer of a hardenable or cold-setting synthetic resin composition such as Araldite in liquid condition is introduced between the outer surface of the sleeve and the inner surface of the hub and the force-fitting pressure between the sleeve and hub maintained until the resin composition has set.

3,577,629

BONDING OXIDIZABLE METALS TO INSULATORS

George Wallis, Lexington, and John J. Dorsey, Waltham, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

No drawing. Filed Oct. 18, 1968, Ser. No. 768,911

Int. Cl. B23k *31/02*

U.S. Cl. 29—472.9 **12 Claims**

An insulating member, such as a glass or fiber-optic, is bonded to a metallic member without excessive oxidation thereof by first heating the insulating member to a relatively low temperature and impressing a voltage across the members, causing an attraction between them which largely excludes atmospheric oxygen from the region to be bonded. The lowered resistivity of the insulator at this temperature also causes a low-density electric current to flow from one member to the other. The insulating member is then heated to a higher temperature while a voltage is maintained across the members, at which temperature a permanent bond is formed between the members in a relatively short time.

3,577,630

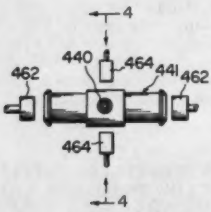
METHOD OF ATTACHING TRANSMISSION BELT AND PIN

Bernard S. Appleton, 926 Midway, Woodmere, N.Y.

Division of 699,970, Jan. 23, 1968, Pat. No. 3,479,893. Continuation-in-part of Ser. No. 566,960, July 21, 1966, Pat. No. 3,451,282. Application Sept. 4, 1969, Ser. No. 855,346

Int. Cl. B21d *39/00;* **B23p** *11/00*

U.S. Cl. 29—517 **3 Claims**



This invention relates to flexible transmission belts adapted for use with sprocket wheel means. The transmission belts comprise transmission pin means with, or without, rollers, held together serially by an elongated body construction such as cable made of wire, cord, fabric or other suitable material. The invention contemplates a method of attaching the pins to the belt or cable, or cables by providing a pin with an opening adapted to encircle the cable, greater in diameter than the diameter of the cable, and then applying pressure to the pin until the material of the pin flows into at least a portion of the clear space between the cable and the opening in the pin so that a mass of material of the pin will grip the cable securely.

3,577,631

PROCESS FOR FABRICATING INFRARED DETECTOR ARRAYS AND RESULTING ARTICLE OF MANUFACTURE

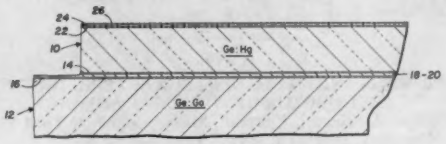
Ernest G. Bylander, and Hall E. Jarman, Dallas, Tex., assignors to Texas Instrument Incorporated, Dallas, Tex.

Filed May 16, 1967, Ser. No. 638,915

Int. Cl. B01j *17/00;* **H01c** *7/08*

U.S. Cl. 29—572 **22 Claims**

An infrared detector array is fabricated by alloying a slice of mercury doped germanium to a degenerate germanium substrate. After being lapped to the desired thickness, the slice is etched through to the substrate to form individual detector bars using a metal mask which is then partially removed to form a gold contact strip on each bar. Output conductors are formed by patterning copper films ther-



mocompression bonded to high temperature plastics, gold plating the conductors, and connecting the gold plated conductors to the gold contact strips by gold jumper wires thermocompression bonded to the conductors and to the contact strips.

3,577,632

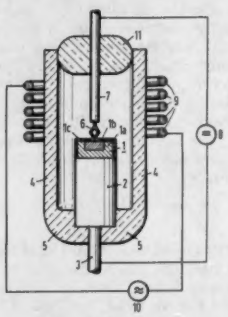
METHOD OF PRODUCING SEMICONDUCTOR DEVICE IN GLASS HOUSING

Ernst Hofmeister, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of application Ser. No. 635,919, May 3, 1967, now abandoned. This application Sept. 18, 1969, Ser. No. 859,596

Int. Cl. B01j *17/00;* **H01l** *7/20*

U.S. Cl. 29—585 **4 Claims**



An electrical conductor is extended through an open end of a glass housing into permanent electrical contact with a semiconductor body of a semiconductor device affixed to and supported by an electrically conductive support member. The open end of the housing is hermetically sealed by heating such open end. The support member passes through the opposite closed end of the housing. An electrical current is passed through the semiconductor device via the support member and the electrical conductor during the hermetic sealing of the open end of the housing.

3,577,633

METHOD OF MAKING A SEMICONDUCTOR DEVICE

Makoto Homma, Tokyo, and Toshiaki Saito, Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of application Ser. No. 685,878, Nov. 27, 1967, now abandoned. This application Oct. 1, 1969, Ser. No. 864,288

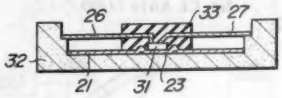
Claims priority, application Japan, Dec. 2, 1966, 41/78682

Int. Cl. B01j *17/00;* **H01l** *1/10*

U.S. Cl. 29—588 **8 Claims**

A method of assembly of a transistor, wherein a lead support member and pairs of collector lead molds are punched in advance in a tape-shaped metal sheet; a lead support member corresponding to said lead support member and

pairs of emitter-base lead molds are punched in another tape-shaped metal sheet; a collector electrode of a planar type transistor is put into contact with the center of said collector lead; the position of the end parts of the base and emitter leads with respect to the position of said collector lead is defined by piling up said two support members and thereby

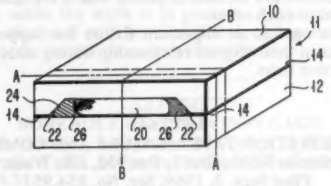


the end parts of said two leads are put into contact with said base and emitter electrodes of the transistor; all of said leads and electrodes corresponding thereto are coupled mutually by soldering; said transistor part is molded with resin; and said leads are removed from said respective support members.

3,577,634
METHOD OF MANUFACTURING A MAGNETIC HEAD ASSEMBLY

Duane R. Secrist, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 18, 1969, Ser. No. 834,476
Int. Cl. H01f *7/06*
U.S. Cl. 29—603 **6 Claims**



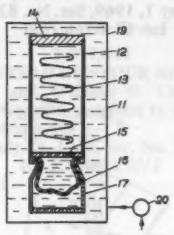
A magnetic head slider assembly, used in disc storage files for air bearing noncontact recording is formed from three parts that enclose a glass-bonded ferrite core. During manufacture, a high temperature glass is used to form the nonmagnetic gap in the core, and a low temperature glass is disposed adjacent to the gap glass between the pole pieces of the core. When the core is positioned within a cavity of the slider, the core containing both glasses is heated sufficiently to cause only the low temperature glass to flow and fill the cavity, thereby bonding the core to an inner wall of the cavity within the slider assembly.

3,577,635
METHOD FOR ISOSTATIC COMPRESSION, SUCH AS THE MANUFACTURE OF POWDER BODIES

Carl Bergman, and Harry Claesson, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 30, 1968, Ser. No. 771,966
Claims priority, application Sweden, Nov. 8, 1967, 15322/67
Int. Cl. H01c *15/04, 17/00*
U.S. Cl. 29—615 **4 Claims**

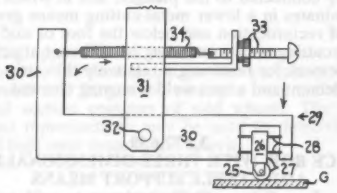
A body to be compressed is inserted within a flexible container containing a compression medium compatible with the body and the container is then placed within an outer compression chamber containing another compression medium compatible with the container and chamber.



3,577,636
RESILIENT CUTTER

Robert P. Detorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of application Ser. No. 640,285, May 22, 1967, now abandoned. This application Jan. 7, 1969, Ser. No. 789,468
Int. Cl. B26b *3/00;* **B26d** *3/08*
U.S. Cl. 30—164.95 **2 Claims**

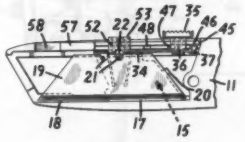


A scoring device with a resilient connection between a support and a scoring head to provide a uniform scoring pressure on a glass surface resulting in a uniform severing line.

3,577,637
RETRACTABLE BLADE KNIFE

Paul A. Braginetz, Augusta County, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Sept. 24, 1968, Ser. No. 761,903
Int. Cl. B26b *3/08*
U.S. Cl. 30—162 **6 Claims**

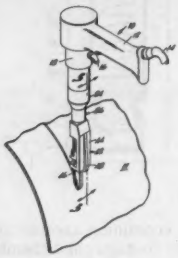


An industrial blade holder combination with the blade being mounted on a carrier and selectively movable to retracted and operative positions including a position in which the blade is readily removable for replacement, the combination including a blade magazine for replacement blades, the magazine being replaceably mounted in the handle and arranged to enable individual blades to be dispensed therefrom for insertion in the handle while the magazine remains in the handle.

3,577,638
CUTTING TOOL ATTACHMENT FOR A POWER HAMMER

Earl Chandler, 17211 N.W. 37th Ave., Opa-Locka, Fla.

Filed May 1, 1969, Ser. No. 821,044
Int. Cl. B26b 7/00
U.S. Cl. 30—277 6 Claims

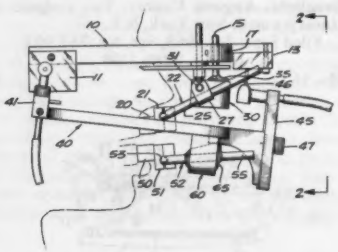


A powered panel cutter attachment for a power hammer having an impacter element and including a tubular housing removably attached to the impacter had having a reciprocable plunger oscillatable in a housing which terminates in a substantially C-shaped guide and support foot including a rear guide surface parallel to the path of reciprocation of the plunger and in spaced relation therefrom a T-shaped slot, and in which a tool element body includes opposed, parallel portions reciprocably and guidingly engaged by the respective parallel inner surface and T-shaped slot portions and is detachably connected to the plunger, and in which said tool body terminates in a lower metal-cutting means generally at the axis of reciprocation and below the foot of said housing; the metal-cutting means including on different attachments a cutting element for removing a relatively thin strip of metal, a chisel element and a spot-weld removing element.

3,577,639
FACE BOW WITH THREE-DIMENSIONALLY ADJUSTABLE SUPPORT MEANS

Robert L. Lee, Colton, Calif., assignor to said assignor to Gene W. Arant, Los Angeles, Calif.; said assignor to Juanita F. Arant, Los Angeles, Calif.; said assignor to Robert L. Lee, Los Angeles, Calif. and said assignor to Arlene M. Lee, Los Angeles, Calif., fraction part interest to each

Filed June 13, 1968, Ser. No. 736,613
Int. Cl. A61c 9/00
U.S. Cl. 32—19 15 Claims



Jaw movement recording apparatus including an upper face bow supported from an upper clutch, and a lower face bow supported from a lower clutch. Each clutch carries a vise grip, and a U-shaped bolt or rod has its base or middle portion supported from the vise grip. The legs of each U-shaped bolt or rod project in a generally forward direction for supporting the associated face bow. Four adjustment members are used which are hollow, one being associated with each of these legs. After precise adjustment of the position of the face bow in three dimensions has been achieved, each of the hollow adjustment members is filled with quick-setting plaster to capture the then existing position of an associated rod end which projects into the cavity of the member.

3,577,640
DENTAL CLUTCHES, AND METHOD AND APPARATUS FOR MAKING

Robert L. Lee, 22937 Grand Terrace Road, Colton, Calif.

Filed Oct. 8, 1969, Ser. No. 864,742
Int. Cl. A61c 11/00
U.S. Cl. 32—32 3 Claims

A dental clutch is disclosed consisting of a rigid tray made of a sheet of plastic material which is shaped to fit over and around the tooth structure of one jaw of a patient; and a preformed plastic stud block having a curved rear face and having a front flat face in which two laterally separated, parallel threaded openings are formed; the stud block being secured to the front vertical surface of the tray so that the threaded openings lie in a plane which is common to the tooth structure.

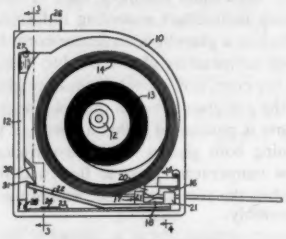
A method of aligning upper and lower clutches for a patient is also disclosed, in which the threaded openings of the two stud blocks are located in planes which are spaced apart but parallel to each other.

Also disclosed is an alignment fixture for supporting the stud blocks in their aligned relationship during attachment to the respective trays.

3,577,641
COMBINATION TAPE MEASURE AND COMPASS

Leedice Solomon Smith, Rte. 1, Box 132, Elk, Wash.

Filed Sept. 3, 1969, Ser. No. 854,953
Int. Cl. B43l 9/04
U.S. Cl. 33—27 9 Claims



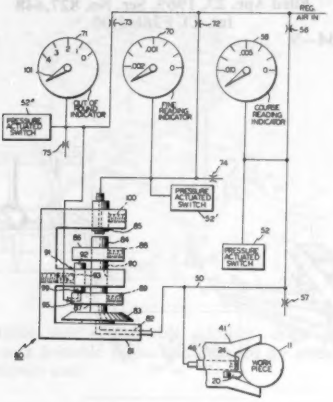
A coiled measuring tape is mounted within a case having an inner recess. A releasable locking clamp is located within the case recess for selectively fixing the tape relative to the case. It is operated by an external movable member that extends within the case for manually locking the tape and simultaneously causing a compass point fixed to it to protrude beyond the case. By use of the compass point, a circle can be scribed at the outer end of the tape. When released, the device permits the tape to be used for measuring purposes in the normal fashion.

3,577,642

IN-PROCESS WORKPIECE GAGING APPARATUS

Joseph V. Tripoli, 329 Troy-Del Way, Williamsville, and John J. Caligiuri, West Seneca, N.Y.

Filed Feb. 12, 1968, Ser. No. 704,726
Int. Cl. G01b *13/00*
U.S. Cl. 33—172 6 Claims



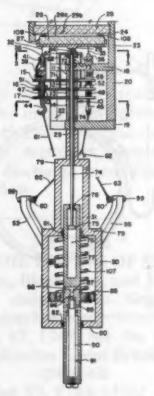
There is disclosed a system for gauging the dimensions of a machined surface of a workpiece being machined by a lathe or similar device, while it is being machined. To accomplish this, a machine tool having the cutting edge has affixed thereto a feeler gauge in such position as to encounter the workpiece in a region where it has just been machined. This gauge then moves with the cutting tool over the newly worked surface to give an indication of any variations from tolerance while the work is in process. A pneumatic gauge system is disclosed with particular feeler gauge structure to permit it to be used with various size parts.

3,577,643

BOREHOLE DEFORMATION GAGE

Thomas R. Schmidt, Lafayette, and Walter H. Husing, Walnut Creek, Calif., assignors to Shell Oil Company, New York, N.Y.

Filed May 18, 1967, Ser. No. 639,368
Int. Cl. E21b *47/08*
U.S. Cl. 33—178 10 Claims



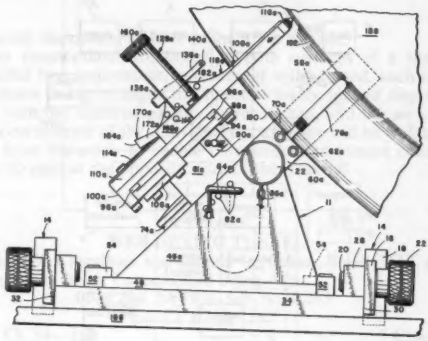
Internal stress of earth structure in situ may be determined by drilling a pilot hole and inserting a recording borehole deformation gage therein. Subsequently, the pilot hole including the recorder is recovered as a core by drilling out an annulus of the earth including the pilot hole. The borehole deformation gage is an optical interferometer instrument that is continuously monitored at short time intervals photographically.

3,577,644

WHEEL TREAD CONTOUR APPARATUS

Edward Ratcliffe, and William N. Crawford, Mont. St. Hilaire, Quebec, Canada, assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed July 26, 1968, Ser. No. 747,937
Int. Cl. B61k *9/12*
U.S. Cl. 33—203.11 9 Claims



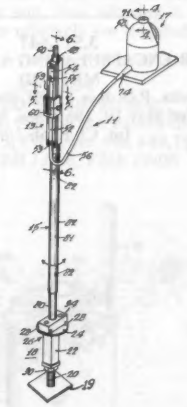
A testing apparatus has indicators to measure the elevational distance between points on the periphery of wheels having treads and flanges and means to trace and reproduce peripheral section contours of said wheels. The measurements and reproductions may be used to determine wheel wear and high wear areas of the wheels.

3,577,645

LEVELING APPARATUS FOR INSTALLATION OF RAISED FLOORS

Walter S. Zurawski, 7500 N. Elmhurst Road, Box 263, Bensenville, Ill.

Filed July 22, 1969, Ser. No. 843,624
Int. Cl. G01c *5/04*
U.S. Cl. 33—209 10 Claims



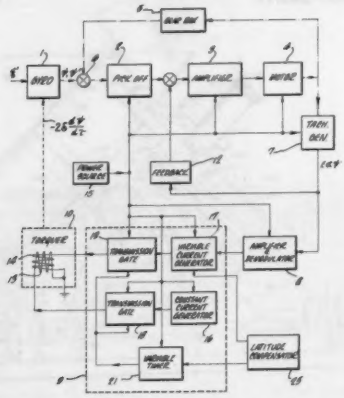
Apparatus for installing raised floors by means of adjusting leveling jacks, which apparatus includes a leveling head with a sight glass connected to a liquid reservoir, rotatable support shaft for the head having a base adapted for driving engage-

ment with a floor support jack and a rolling contact marker for scribing a level line for installing a drop ceiling.

3,577,646
METHOD OF DAMPING DEVICES HAVING OSCILLATORY MOTION

Harry Nils Eklund, Pacific Palisades, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Nov. 30, 1967, Ser. No. 687,049
Int. Cl. G01c *19/38*
U.S. Cl. 33—226 **10 Claims**



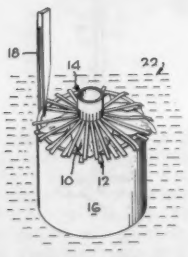
A method for damping an oscillating mechanical system to bring it to rest at or near its equilibrium position employing iteratively a fixed damping cycle consisting of a first interval of undamped motion followed by a second interval of supercritically damped motion, the process being iterated a sufficient number of cycles to position the system as close as desired to the equilibrium position.

A preferred application of this method of damping is in connection with a meridian-seeking gyroscope, where the first interval of undamped motion consists of free precession of the gyroscope pin axle toward the meridional plane, followed by a second interval of supercritical damping that positions the spin axle closer to the meridional plane than at the release of the motion. By repeating the appropriately timed intervals of the cycle a number of times, the spin axle of the meridian-seeking gyroscope can be brought as close to the meridional plane as desired.

3,577,647
FLOWER-ENCAPSULATING APPARATUS AND METHOD

Mike S. Shimooka, P.O. Box 11184, Honolulu, Hawaii

Filed May 19, 1969, Ser. No. 825,753
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **11 Claims**

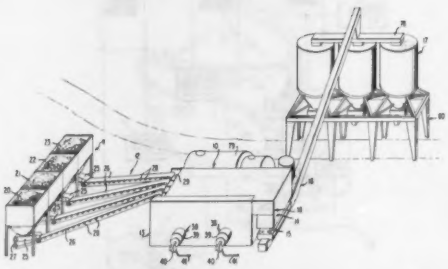


Apparatus and method for encapsulating flowers, particularly orchids, in plastic, comprising mounting a flower on a jig assembly that holds it in its natural-appearing shape, and sinking the assembly in an alcohol solution to dehydrate the flower so that it can be encapsulated in plastic.

3,577,648
BITUMINOUS MIXING METHOD AND APPARATUS

James D. Brock, Chattanooga, Tenn.

Filed Apr. 23, 1969, Ser. No. 827,448
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **11 Claims**

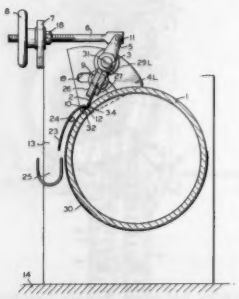


A mixing method and apparatus wherein rock aggregates of graded sizes are stored in separate storage bins and conveyed separately through a heating zone, simultaneously heated, and combined together in predetermined portions. A heated bituminous liquid is added to the combined aggregates in predetermined proportions, and the aggregates and bituminous liquid are mixed together to form a hot asphaltic composition.

3,577,649
DEVICE AND METHOD FOR CONTROLLING BULK DENSITY OF DEHYDRATED FOODSTUFFS

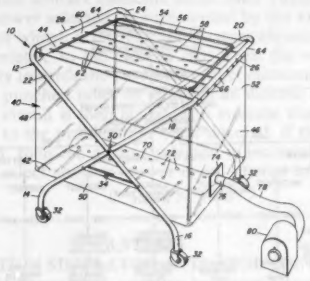
James I. Wadsworth; Alexander S. Gallo, Metairie; George M. Ziegler, Jr., Harahan, and James J. Spadaro, New Orleans, La.

Division of Ser. No. 690,536, Dec. 14, 1967, Pat. No. 3,494,050, Feb. 10, 1970, application Aug. 29, 1969, Ser. No. 872,795
Int. Cl. F26b *17/28*
U.S. Cl. 34—110 **1 Claim**



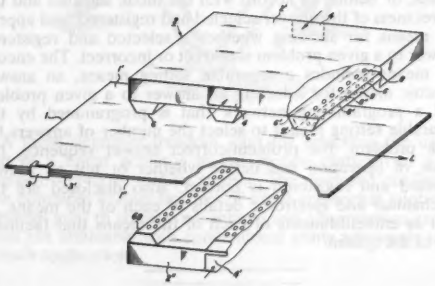
Bulk density of high-sugar-content dehydrated foodstuff is regulated by varying the thickness of the sheet of the said dehydrated foodstuff as it is being discharged from a drum dryer. The thickness of the said sheet is here varied upon varying the angle of attack of the doctor blade in respect to the drum surface of a drum dryer.

3,577,650
PORTABLE AND COLLAPSIBLE CLOTHES DRIER RECEPTACLE
Harry Brahm, P.O. Box 372, Riverside Station, Miami, Fla.
Filed Feb. 18, 1969, Ser. No. 800,073
Int. Cl. F26b *19/00*
U.S. Cl. 34—151 **4 Claims**



A portable and collapsible clothes drier receptacle mounted on a foldable frame and adapted for attachment to a heater-blower unit.

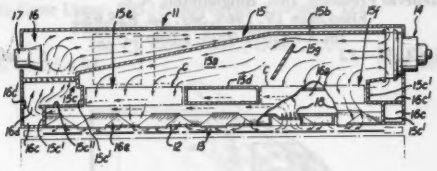
3,577,651
APPARATUS FOR AIR-TREATING SHEET MATERIAL SURFACES AND THE LIKE
John A. Nichols, Canton, Mass., assignor to Industrial Air Company, Inc., Shreveport, La.
Filed Dec. 5, 1968, Ser. No. 781,440
Int. Cl. F26b *13/02*
U.S. Cl. 34—155 **6 Claims**



This disclosure deals with the air-treating of sheet material surfaces and the like by introducing pressurized air upon the material through novel transversely extending and longitudinally spaced nozzle members provided with vertically separated perforated discharge members for providing substantially uniform air flow.

3,577,652
APPARATUS FOR THE DRYING OF SHEET MATERIAL
Raymond Victor Evans, Blackburn, and John Edward Hibbitt, Darwen, England, assignors to Singer-Cobble Limited, Blackburn, Lancashire, England
Filed Mar. 17, 1969, Ser. No. 807,855
Claims priority, application Great Britain, Mar. 18, 1968, 12970/68
Int. Cl. F26b *13/02*
U.S. Cl. 34—155 **14 Claims**

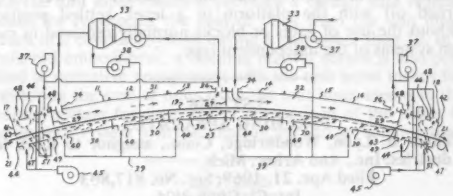
An apparatus for applying heated air to the surface of a sheet material has a dryer surface at an outer wall of a boxlike structure, the dryer surface being defined by alternate openings and apertured surface regions in the said outer wall, the apertured surface regions being connected together inwardly of the boxlike structure and being isolated from the openings, and a substantially closed air circulation system is developed by the apparatus when in use, air passing outwardly through the apertured surface regions and inwardly through the openings, or vice versa, during the surface treatment of a sheet material arranged in closely spaced



adjacent disposition relative to the dryer surface.

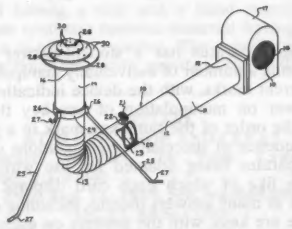
For simultaneous treatment of both surfaces of a sheet material two apparatuses as aforesaid will be used, such apparatuses being arranged in opposed closely spaced disposition with the material passing therebetween, and the air circulation systems of the individual apparatuses will be isolated one from the other to enable independent treatment conditions to exist at the opposite sides of the material.

3,577,653
WEB DRYING TUNNEL
John A. McClenathan, and Donald L. Nielsen, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.
Filed Jan. 20, 1970, Ser. No. 4,293
Int. Cl. F26b *13/00*
U.S. Cl. 34—156 **7 Claims**



An elongate moving web passing through a drying tunnel is supported along a slightly arched path by pressurized air directed against its concave lower face. The arched path of the web tends to prevent it from bowing transversely, thereby facilitating maintaining it in central relation to the tunnel by means of the air escaping upwardly around its edges. Additionally, the resulting profile of the web inherently reduces its tendency to wrinkle or sag, thus allowing it to be drawn through the tunnel under relatively low longitudinal tension.

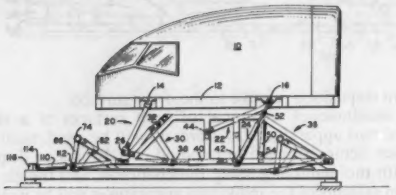
3,577,654
FORCED AIR DIFFUSER
James A. Marley, 801 W. Hudson St., Fayetteville, N.C.
Filed Aug. 13, 1969, Ser. No. 849,757
Int. Cl. F24f *13/06;* **F26b** *19/00*
U.S. Cl. 34—231 **3 Claims**



In abstract, a preferred embodiment of this invention is a portable air diffuser including an air duct network fitted at

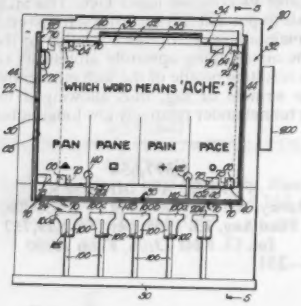
the intake extremity with a blower and having a series of baffles attached to the outflow extremity with intermediate dampening control means.

3,577,655
MOTION SIMULATOR
Edward G. Pancoe, Chenango Forks, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.
Filed May 19, 1969, Ser. No. 825,652
Int. Cl. G09b *9/08*; F16m *11/32*
U.S. Cl. 35—12 **5 Claims**



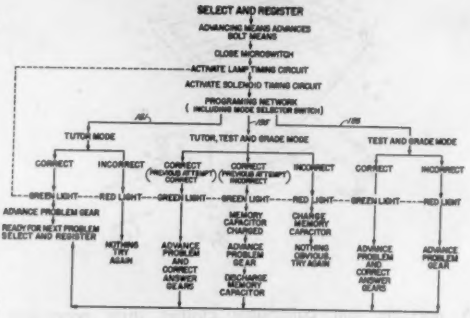
A motion system for a vehicle simulator, or the like, of the type wherein independent, extensible actuators are provided for moving the motion platform in each single axis of freedom relative to a fixed base. The present invention provides such a system with greatly improved excursion limits and simultaneous motion in more than one axis (by simultaneous movement of more than one actuator) by erecting the platform and linkage from a settled to a reference position through the use of an additional actuator which is not used for movement of the platform during operation of the system. The arrangement also allows actuator power to be turned off with the platform in a level, settled position without the use of gates or blocks normally required in motion systems of the independent type.

3,577,656
TEACHING APPARATUS
William H. Lyon, Woodbridge, Conn., assignor to KMS Industries, Inc., Ann Arbor, Mich.
Filed Apr. 21, 1969, Ser. No. 817,803
Int. Cl. G09b *3/06*
U.S. Cl. 35—9 **20 Claims**



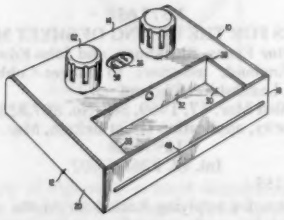
A teaching apparatus has a student-answer registering device including a number of individually manipulatable keys bearing different marks, with the device indicating a correct student answer on manipulation of any key the mark of which is in the order of the same key mark in a preassigned recurring sequence of successive manipulations of the keys, and the apparatus being adapted for use with successive cards or the like of which each card displays a problem question and as many answers thereto, including one correct one, as there are keys, with the answers on each card being marked the same as the keys, and the marks applied to the correct answers on successive cards conforming to the preassigned key mark sequence.

3,577,657
APPARATUS FOR PROGRAMED INSTRUCTION AND TESTING
George W. Plumly; Jack B. Hunnicutt, and Charles R. Deyo, Fort Worth, Tex., assignors to Edu-Tronics Corporation, Forth Worth, Tex.
Filed May 8, 1969, Ser. No. 823,058
Int. Cl. G09b *7/04*
U.S. Cl. 35—9 **19 Claims**



A programmable system for effecting automated teaching and including modes effecting testing and grading also, for use in conjunction with problem and answer material wherein a plurality of answers are provided for each problem arranged in accordance with a given program, characterized by an encoding means for conforming the system to the program, a problem display means for displaying the number of a given problem; a correct answer display means for displaying the number of correct answers selected and registered; advancing means selectively operable for advancing both the correct answer number display means and the problem number display means, only the problem number display means, or neither in accord with the mode selected and the correctness of the answer selected and registered; and apprising means for showing whether a selected and registered answer to a given problem is correct or incorrect. The encoding means includes a separable setting means, an answer selector means for selecting an answer to a given problem and a programming network that is programmed by the separable setting means to select the number of answers for each problem, the problem-correct answer sequence, the mode of operation and define whether or not an answer selected and registered is correct. Also disclosed are the mechanical and electronic details of each of the means, as well as embellishments of each of the means that facilitate use of the system.

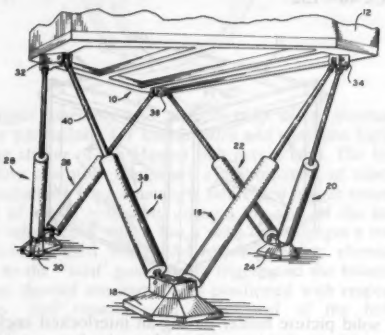
3,577,658
TEACHING AID
Harold Weinstein, 1820 Avenue V, and Edward Snyder, III, 3323 Fillmore Ave., Brooklyn, N.Y.
Filed Aug. 11, 1969, Ser. No. 849,000
Int. Cl. G09b *7/00*
U.S. Cl. 35—9R **8 Claims**



A teaching machine for use in self-instruction. A programmed card containing a problem and coded answer in the

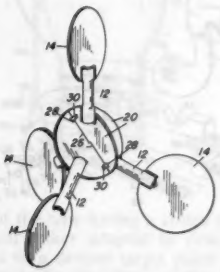
form of punched holes is inserted in the housing of the machine beneath a pair of wheels which are mounted in the housing for independent rotation and axial movement. The answer to the problem is selected by rotating the pair of wheels which have multiple indicia imprinted thereon which are selectively exposed to view during rotation. When the exposed indicia on each wheel are read together, they provide a proposed answer to the problem on the card. The wheels carry electrical contact elements about their circumference, and if the answer selected, as represented by the exposed indicia on each wheel, is correct, the contact elements will be positioned relative to the card so that when the wheels are moved axially towards the card the contact elements will pass through the punched holes to establish an electric circuit. A lamp in the circuit is then actuated to indicate that the correct answer to the problem has been selected. If the lamp is not actuated, then the answer selected is incorrect and the student can select another answer in an attempt to solve the problem.

3,577,659
MOTION SIMULATOR ACTUATOR JOINT
Karl Kail, Montrose, Pa., assignor to Singer-General Precision, Inc., Binghamton, N.Y.
Filed Aug. 6, 1969, Ser. No. 847,931
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 **7 Claims**



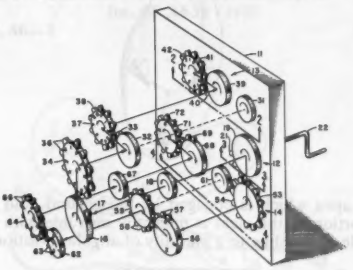
A three degree-of-freedom joint for attaching the upper end of a linear actuator to the motion platform of a six degree-of-freedom motion system. The disclosed configuration combines certain features of a ball-and-socket joint with a gimbal joint to achieve advantages and allow motion excursions not attainable with conventional joints previously used in such applications.

3,577,660
LINKAGE FOR MODEL-FORMING DISCS
Malcolm E. Kenney, 1203 Hereford Road, Cleveland Heights, Ohio
Filed Oct. 28, 1968, Ser. No. 771,121
Int. Cl. G09b *23/26*
U.S. Cl. 35—18 **1 Claim**



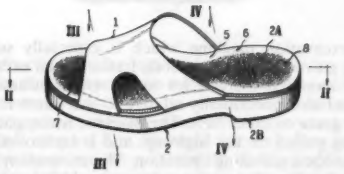
An apparatus for constructing molecular models having, as atom-representing members, both single discs and interengaged mutually perpendicular double discs and, as chemical bond-representing members, hollow tubes which are frictionally received over valence-representing recessed nibs on the discs.

3,577,661
TEACHING AID
Eldo Gene Usrey, 2052 Sunnybrook, Garland, Tex.
Filed July 16, 1969, Ser. No. 842,120
Int. Cl. G09b *19/02*; **G06c** *27/00*
U.S. Cl. 35—32 **6 Claims**



The present invention relates to apparatus for aid in the instruction of mathematics and, more particularly, it relates to apparatus for demonstrating counting systems to a base other than 10. In one form, the present invention may comprise a mechanical input means which functions to place arithmetical units of one into the system. In operative engagement with the unit input means is provided a variant base register means for registering the sum of units from the unit input means in a counting system having a base other than 10. In a preferred embodiment, a decimal register means is also provided in operative engagement with the unit input means for registering the sum of units from the unit input means in the decimal system for purposes of comparison of the totals in the decimal system with the totals in the variant base system.

3,577,662
FOOTWEAR
Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome Shin-minami-Fukushima, Tokushima, Japan
Filed Jan. 14, 1970, Ser. No. 2,877
Int. Cl. A43b *3/12*
U.S. Cl. 36—11.5 **4 Claims**



A sandal having a sole and a band member integrally molded from synthetic resinous material having a foamy interior and a nonfoamy exterior. The specific gravity of the sole is lower than the specific gravity of the band member.

3,577,663
ATHLETIC SHOE AND CLEAT
Howard Bruce Mershon, 14 Saint Lawrence Ave., Maplewood, N.J. 07040
Filed Aug. 11, 1969, Ser. No. 849,099
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 **8 Claims**

An athletic shoe and cleat wherein the exposed portion of the cleat is formed of a polyhedron forming at least two lines in a common plane, with one of the lines extending at a

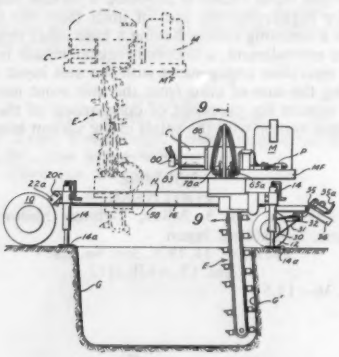
greater angle with respect to the sole of the shoe than the other of the lines. A portion of the planes forming the polyhedron each have a vertex lying in a common point to

form an apex which is engaged by the ground, and the exposed portion of the cleat is manually movable with respect to the sole of the shoe to a plurality of angular positions.

3,577,664
EXCAVATION MACHINE HAVING IMPROVED DIGGING ELEMENTS

T. J. Sing, and Reuben C. Sing, Pharr, Tex., assignors to Delta Diggers, Inc.

Filed July 22, 1968, Ser. No. 746,411
Int. Cl. E02f *3/14, 5/20*
U.S. Cl. 37—192 **6 Claims**



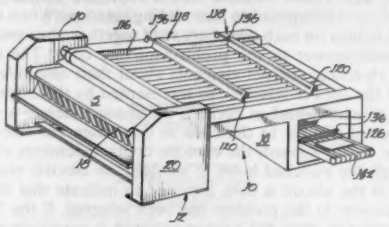
An excavation machine which is especially suitable for digging graves, wherein a mobile frame has an excavating assembly mounted thereon for movement substantially vertically and also horizontally relative to the frame for excavating the grave or other hole. The machine is compact, capable of being pulled on the highway, and is controlled hydraulically for the excavating operation. The excavation is effected with a plurality of scratching elements which scratch the dirt from the vertical wall and collect same in buckets on an endless conveyor, with such conveyor preferably being at a small angle with respect to vertical to obtain more effective, smooth excavating action so that the frame for the machine does not shift or move from its location during the excavating operation.

3,577,665
LAUNDRY APPARATUS

Eduard F. Kamberg, Deerfield, Ill., assignor to Chicago Dryer Company, Chicago, Ill.

Filed Sept. 8, 1969, Ser. No. 856,126
Int. Cl. D06f *61/08, 65/10, 69/02, 89/00*
U.S. Cl. 38—2 **5 Claims**

A finishing apparatus comprising a high-speed ironer cylinder and folder is provided which is adapted to process fabrics comprising polyester-cotton flatwork with a resin finish, polyester-cotton flatwork with no resin finish, as well as plain cotton flatwork. The provided apparatus includes a high-speed ironer cylinder having an extremely large portion

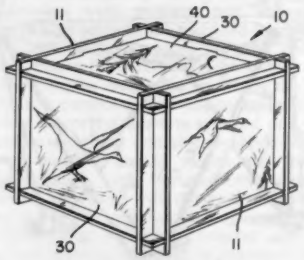


of the circumferential surface contacting flatwork to be ironed, and a folder portion arranged in series with said ironer and adapted to impart a plurality of transverse folds and cross-folds in the freshly ironed piece.

3,577,666
PICTURE HOLDER

Norman Wexler, 21218 Chase St., Canoga Park, Calif. 91304

Filed Dec. 15, 1969, Ser. No. 885,100
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **7 Claims**

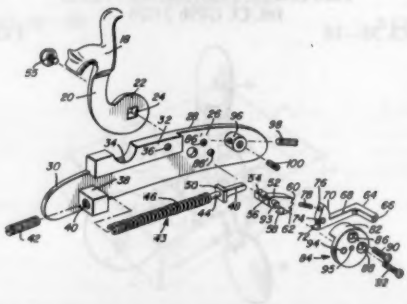


A solid picture holder having an interlocked enclosed series of identical side panels with each alternate side panel being inverted, a pair of end panels attached to the top and bottom of the series of side panels, and a retainer within said side and end panels to hold pictures against their interior surface.

3,577,667
LOCK FOR PERCUSSION CAP RIFLE

Robert P. Kern, 319 E. Main St., Ligonier, Pa., and Allen J. Hamm, 251 McKimm Drive, Pittsburgh, Pa.

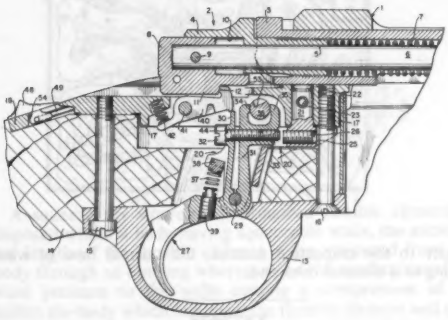
Filed Oct. 29, 1968, Ser. No. 771,411
Int. Cl. F41c *19/00*
U.S. Cl. 42—69 **5 Claims**



A gunlock having a hammer which pivotally mounts a ratchet member. A separate sear includes a pawl element

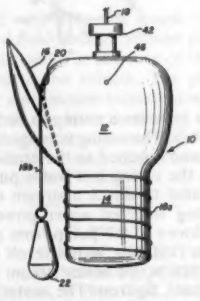
which engages the ratchet member upon cocking of the hammer. A coil spring device bears against the ratchet so that release of the sear by a trigger causes rapid rotation of the ratchet and commensurate striking of the hammer.

3,577,668
TRIGGER AND SAFETY ASSEMBLY FOR FIREARMS
William B. Ruger, Southport, Conn., and Leroy J. Sullivan, Huntington Beach, Calif., assignors to Sturm, Ruger & Co., Inc., Southport, Conn.
Filed July 22, 1969, Ser. No. 843,385
Int. Cl. F41c *17/02, 19/00*
U.S. Cl. 42—70E **9 Claims**



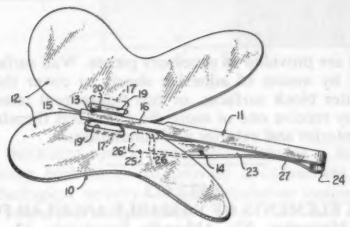
A trigger assembly and an anticreep safety mechanism therefor particularly for use in rifles and shotguns having a cartridge striker of the Mauser bolt action type. The trigger and safety assembly comprises a combination of elements which includes a trigger having a bifurcated trigger extension one leg of which releasably engages the sear of the striker and the other leg of which has a yoke that engages a rotatable safety element. When the rotatable safety element is rotated to the "safe" position the trigger and the bifurcated extension thereof are immovably positioned with respect to the sear, and rotation and withdrawal of the bolt is prevented.

3,577,669
FISHING BOBBER
Joseph A. Johnson, 12272 W. Mississippi Ave., Denver, Colo., and Ray Key, 4858 Meade, Denver, Colo.
Filed June 23, 1969, Ser. No. 835,519
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.11 **4 Claims**



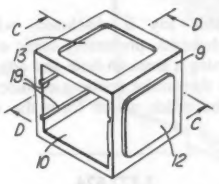
Fishing bobber of the type having a coiled supply of drop line with a terminal sinker adapted to descend after the bobber is delivered to a desired target point on the water, characterized by an inclined surface on the bobber which maintains the sinker attached to same until the bobber strikes the water, the buoyancy and attitude at which time permits a securing loop of drop line to slide off of the inclined surface; further characterized by a manually operable line clutch for adjusting the length of the drop line, the clutch also adapted to slip relative to the line during retrieval of a fish when the bobber engages the end of a fishing rod to thereby permit the drop line to be reeled in for landing the fish.

3,577,670
WING FLAPPING TOY
Peter Paul Gutierrez, 3101 Fresno St., Santa Clara, Calif.
Filed Feb. 19, 1969, Ser. No. 800,615
Int. Cl. A63h *11/00*
U.S. Cl. 46—1 **6 Claims**



A wing flapping toy simulating a creature of nature such as a butterfly and the like by a simple wing mount on a handle and gripping means on the latter for manipulating the wings in unison.

3,577,671
CONSTRUCTION KITS FOR TOYS AND MODELS
Roy Perry Woollett, Apsley Mead, Cocking, Midhurst, England
Filed Feb. 26, 1969, Ser. No. 802,550
Int. Cl. A63h *33/00*
U.S. Cl. 46—16 **14 Claims**

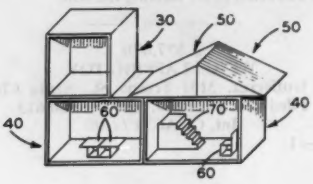


A construction kit for toys comprises a plurality of components for fitting together in various ways. One component is in the form of a hollow cube open on one, and only one face, having projections on some faces and recesses on the other faces, adapted for frictional interengagement. Half-cube components may be provided for sliding into said cubic components. Other components comprise a flat sheet with upstanding projections, and a flat sheet with recesses, adapted for engagement respectively with recesses and projections of cubic components: a like flat sheet with integral guide or rail means: and a like flat plate with legs extending perpendicular thereto.

3,577,672
MODULAR RIGID BLOCK-TYPE DOLLHOUSE CONSTRUCTION TOY
William Nutting, 15 Charles St., New York, N.Y.
Filed Sept. 1, 1967, Ser. No. 665,035
Int. Cl. A63h *33/06*
U.S. Cl. 46—19 **3 Claims**

This disclosure is directed to a constructional toy and more specifically to a modular dollhouse construction toy comprising a plurality of rigidly constructed hollow blocks some of

which are open at least one side and adapted to be randomly arranged in unconnected, side-by-side and/or stacked relationship with respect to one another to simulate varying dollhouse floor plans. Simulated furniture and little people con-



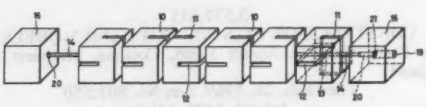
structions are provided as accessory pieces. Wall surfaces are simulated by means of adhesive sheets to cover the inner and/or outer block surfaces, or two transparent telescoping blocks may receive one or more die cut sheets therebetween showing interior and exterior wall simulations.

3,577,673

BLOCK ELEMENTS OF VARIABLE ANGULAR FORM

Ottorino Monestier, Via Abbondio Sangiorgio 12, Induno Olona, Italy

Filed Jan. 24, 1969, Ser. No. 793,787
Claims priority, application Italy, Jan. 31, 1968, 12245
Int. Cl. A63h *33/06*
U.S. Cl. 46—24 **2 Claims**



A dismemberable toy is disclosed, which comprises geometric solid elements, preferably cubic elements, having slotted faces defining a through-hole and adapted to afford a passageway for a threadlike resilient connection element to be fastened to the solids which form the ends of the assembly.

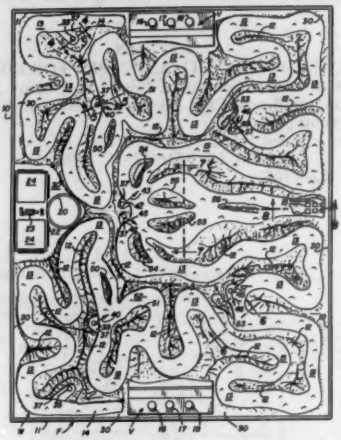
3,577,674

AMUSEMENT DEVICE

John Maguire, Littleton, Colo.; Tim M. Uyeda, South San Gabriel, Calif., and Theodore George Wahler, Denver, Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed June 12, 1969, Ser. No. 832,585
Int. Cl. A63h *29/10*
U.S. Cl. 46—41 **10 Claims**

The amusement device is a water toy having a watercourse structure, vacuum formed from a plastic sheet to provide interleaved and interspaced ridges, with a pair of corresponding, circuitous channels therebetween and merging prior to a common drain. Islands also upstand from the channels. From a sump plate beneath, posts support the watercourse structure, while the watercourse structure and sump plate are also attached around their peripheral edges to an upright frame. The discharge from a battery-operated pump is carried by tubes to a pair of fluid control devices, from which tubes lead to nozzles extending upwardly through the watercourse structure. The nozzle outlets discharge in a direction to direct simulated boats away from impediments along and at corresponding positions in the channels. The connecting tubes are placed in the space between the watercourse structure and the sump plate. The fluid control devices are mounted on the sump plate and extend upwardly through the watercourse structure, while buttons thereon control diversion of



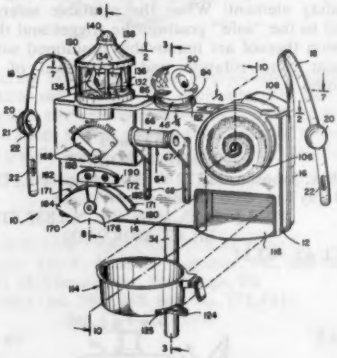
water to the respective nozzles, the normal flow of water being to a channel inlet end.

3,577,675

CHILD'S BATHING TOY

Frank Kohner, New York, N.Y., and Albert Stubbmann, Franklin Lakes, N.J., assignors to Kohner Bros., Inc., East Paterson, N.J.

Filed July 15, 1969, Ser. No. 841,872
Int. Cl. A63h *29/10*
U.S. Cl. 46—41 **18 Claims**



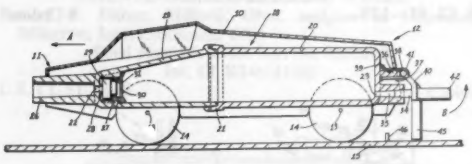
The bathing toy includes a casing to be located on the inside wall of a bathtub. The casing is supported by straps slung over the tub wall and fastened to the outside wall by suction cups. Mounted in the casing is a water pump, the nozzle of which can be rotated to direct a stream of water from the pump for activating selected water powered components. Bathtub water is drawn to the pump from an intake tube immersed below the bathtub water level. With the nozzle pointed in one direction, the water stream strikes a carousel, rotating the carousel figures. The water drains from the carousel to a teeter-totter bucket from which it is discharged into the bathtub. If the nozzle is pointed in another direction, the water stream actuates a turbine wheel and subsequently drains into a bucketlike container seated within the casing. The container includes a circular dish pivotally mounted on the bottom. The circular dish and the container bottom have a plurality of holes which are aligned when the dish is rotated

to a certain position. When the holes in the dish and the bucket bottom are in alignment and the bucket is lifted out of the container, the water flows from the bucket in tiny streams simulating a bathing shower. The pump is so constructed that it has a protracted discharge period after each actuating down stroke of its operating handle.

3,577,676
STRIP-PROJECTING SQUEEZE TOY
Truman W. Powell, 1146 St. Augustine Place N.E., Atlanta, Ga.
Filed Feb. 16, 1965, Ser. No. 433,004
Int. Cl. A63h *7/00*
U.S. Cl. 46—123 **14 Claims**

A squeeze toy wherein an elongated flexible element is disposed within a body having squeezable walls, the substantial length of the flexible element being projected from the body through an opening wherein upon the application of inward pressure to the walls causing a compression of air within the body which impinges the flexible element and carries the substantial length of it outwardly through the opening.

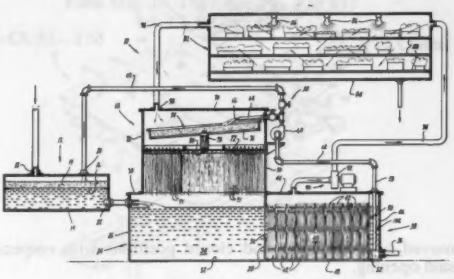
3,577,677
GRAVITY ACTUATED TOY VEHICLE HAVING AUXILIARY JET PROPULSION MEANS
Ambrose L. Bennett, Spotswood, and Sidney Tepper, Millburn, N.J., assignors to Topper Corporation
Filed Oct. 1, 1969, Ser. No. 862,662
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **10 Claims**



A toy wheeled vehicle carries a tank adapted to be filled with a pressurized fluid through an inlet provided with a one-way valve. A tank outlet at the rear of the vehicle is closed by a plug hinged to the vehicle. The plug carries an arm adapted to strike a projection located along the path of travel of the vehicle while the latter is moving under the influence of gravity. The plug is thereby removed from the outlet permitting a jet of fluid to issue from the outlet and give the vehicle a burst of forward thrust.

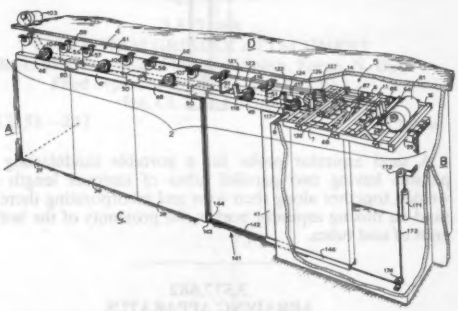
3,577,678
COMBINED WASTE TREATMENT AND GROWTH CHAMBER PROCESS
Robert Edward Burton, Willits, Calif., assignor to Microphor, Inc., Willits, Calif.
Filed Aug. 14, 1969, Ser. No. 850,178
Int. Cl. A01g *9/18*; **C02c** *1/02*
U.S. Cl. 47—58 **10 Claims**

A hermetically sealed combination of a liquid waste treatment system, of a type that utilizes aerobic microorganisms for consumption of waste and production of carbon dioxide as a byproduct, and a growth chamber, such as a conventional greenhouse, for the commercial growth of valuable plants which utilize carbon dioxide for photosynthesis. The



waste treatment system preferably includes a liquid body-containing bark strips to provide a convenient place for microbiological activity. A gas circulation system connects the air in the two components.

3,577,679
MULTIPLE AUTOMATICALLY RETRACTABLE AND EXTENSIBLE SLIDING DOORS IN PLANAR ALIGNMENT
Emil M. Petterborg, 1442 Wright Ave., Sunnyvale, Calif.
Filed May 18, 1970, Ser. No. 37,983
Int. Cl. E05d *13/02*
U.S. Cl. 49—127 **18 Claims**

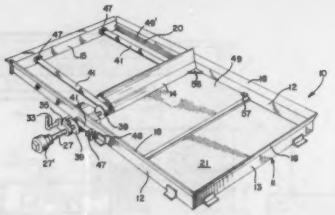


Presented is a sliding door structure for wide openings or for use as a partition to divide a large room into separate rooms and which utilizes separate door panels arranged in close juxtaposition while stored and which are moved individually from storage and placed in edge-to-edge planar alignment to close an opening when extended.

3,577,680
CLOSURE-GATE-ACTUATING MECHANISMS FOR HOPPER DISCHARGE ARRANGEMENT
Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed Feb. 24, 1969, Ser. No. 801,631
Int. Cl. E05f *11/04*; **B61d** *7/20*
U.S. Cl. 49—358 **5 Claims**

A hopper discharge outlet arrangement including a frame and a closure member slidingly movable horizontally relative to a hopper discharge opening, the closure member being moved by the rotation of an operating rod having reels connected thereto on which flexible members are wound and un-

wound and are so anchored and positioned on the frame that in response to the direction of rotation the closure member is

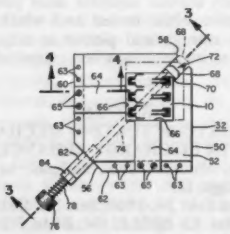


moved between open and closed positions with respect to said opening.

3,577,681
SAND BLASTING EQUIPMENT
Norman E. Waag, 3110 Broadview Road, Cleveland, Ohio
Filed Dec. 11, 1968, Ser. No. 782,854
Int. Cl. B24c *3/06*
U.S. Cl. 51—8 **1 Claim**

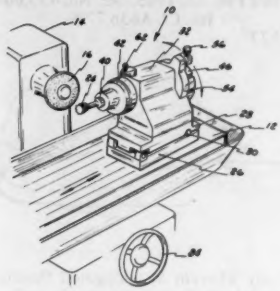
A sand aspirator probe for a portable sandblasting apparatus having two parallel tubes of unequal length and welded together along their axes and incorporating therein a sand-air mixing aspirator port in the proximity of the bottom ends of said tubes.

3,577,682
ABRADING APPARATUS
Walter Kulischenko, East Brunswick, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed June 2, 1969, Ser. No. 829,271
Int. Cl. B24b *41/06*
U.S. Cl. 51—8 **1 Claim**



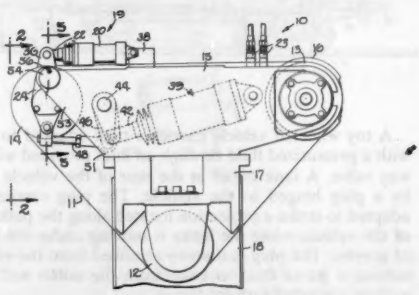
Abrading apparatus is provided with an improved workpiece holder including a plate on which is mounted structure having diverging edge portions and a spring-biased member for clamping the workpiece therebetween.

3,577,683
INVOLUTE GENERATING APPARATUS
Joseph Silvagi, Warren, and John W. Conforti, Detroit, Mich., assignors to Camdale Enterprises, Roseville, Mich.; Joseph Silvagi, fractional part interest to each and John W. Conforti, fractional part interest to each
Filed Aug. 15, 1968, Ser. No. 752,845
Int. Cl. B24b *3/00, 47/02*
U.S. Cl. 51—94 **9 Claims**



A fixture is disclosed for grinding involute teeth profiles in a gear blank. Each tooth is generated by reciprocating the gear blank tangentially with respect to the grinding edge of a rotating wheel while oscillating the blank about its axis as the axis is constrained to move in a plane that is parallel to the axis of the grinding wheel.

3,577,684
ABRADING MACHINE WITH STEERING ROLL AND TENSIONED ABRADING BELT
Zigmant Jakimcius, Rockford, Ill., assignor to Barnes Drill Co., Rockford, Ill.
Filed Dec. 30, 1968, Ser. No. 787,656
Int. Cl. B24b *21/18*
U.S. Cl. 51—135 **8 Claims**



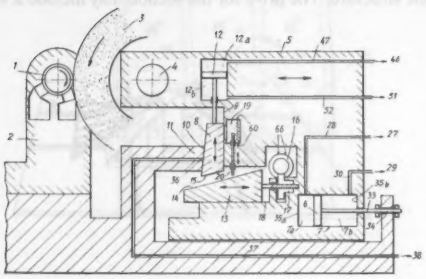
An endless belt abrading machine with a combined steering and tensioning roll which is mounted for up and down tilting movement and which is tilted alternately by oppositely inclined positions by a steering actuator so as to induce edgewise travel of the belt across the roll. The roll also is mounted for swinging toward and away from a second roll for driving the belt and is urged continuously away from the driving roll by a tensioning actuator to tension the belt and keep the latter taut on the rolls as the belt stretches during service use.

3,577,685

GRINDING MACHINE WITH A FEED CONTROL DEVICE

Louis Corbex, and Roger Burdet, Annecy, France, assignors to Societe Nouvelle De Roulements, Annecy (Haute-Savoie), France

Filed Apr. 10, 1968, Ser. No. 720,086
Claims priority, application France, June 13, 1967, 110151
Int. Cl. B24b *49/00*
U.S. Cl. 51—165 8 Claims



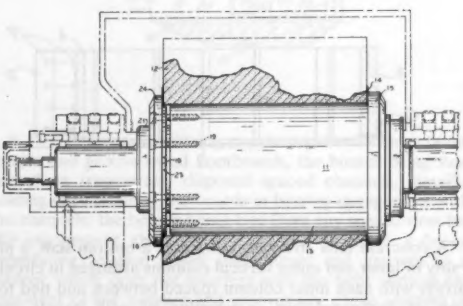
The device comprises the combination of two movable wedge members having each a moderately inclined plane, said wedge members being displaceable in two directions substantially at right angles to each other, the first wedge member abutting at the end of the approach stroke of the grinding wheel against a fixed stop of the frame structure of the machine, the second wedge member determining the end position of the first one, electric means for detecting the end position of the first wedge member in relation to the other one and controlling the finishing and planishing operations performed on the workpiece, by controlling the relative positions of the wedge members.

3,577,686

MOUNTING FOR A GRINDING WHEEL

Robert C. Fisher, Milford, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed June 13, 1969, Ser. No. 833,005
Int. Cl. B24b *41/00*
U.S. Cl. 51—168 7 Claims



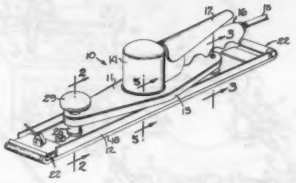
A removable flange for supporting one end of a grinding wheel. The flange is provided with wedge blocks which are held away from the spindle to allow radial positioning of the flange with respect to the spindle in accordance with the alignment of the wheel. The blocks are then released and radially lock the flange with respect to the spindle.

3,577,687

RUBBING MACHINE WITH THRUST-TRANSMITTING MEMBERS

Roy J. Champayne, c/o National-Detroit, Inc., 2810 Aulwin St., Rockford, Ill.

Filed May 29, 1969, Ser. No. 828,857
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 12 Claims



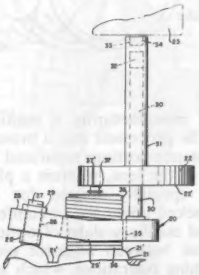
A rubbing machine of the type in which a support is spaced from and overlies a rubbing shoe and in which the rubbing shoe is connected to the support by a drive mechanism operable to gyrate the shoe. The rubbing shoe is rectangular in shape with the drive mechanism connected at the center of the shoe, and two flexible boots are connected between the support and the shoe on diametrically opposite sides of the drive mechanism. In the preferred embodiment, two pair of opposed, rigid studs are mounted between the support and the shoe to transmit thrust therebetween, and each pair of studs is mounted within a respective one of the boots with one of the studs connected to the support and one to the shoe. The opposed ends of the studs are smooth and positioned face-to-face so that the studs may slide on one another and still transmit thrust as the shoe gyrates.

3,577,688

VALVE STEM GRINDER ATTACHMENT

Orville A. Brenden, 1625 Fifth Ave. South, Fargo, N. Dak.

Filed Sept. 26, 1968, Ser. No. 762,942
Int. Cl. B24b *19/00*
U.S. Cl. 51—241 2 Claims

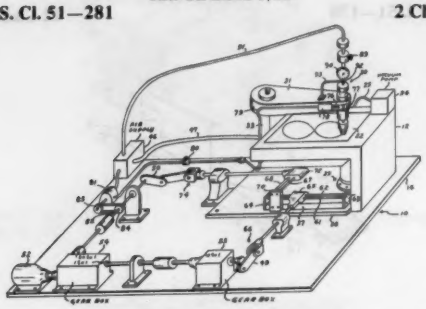


The invention comprises an aligner for grinding valve stems having an elongated plate member with a laterally extending shaft mounted at one end and with the plate having a bore at its other end, said plate has an open area intermediate its length to receive the upper end of the valve stem and valve spring therebetween, said bore at the other end of said plate being adapted to receive the mounting stud of the rocker arm of an engine head and to be locked thereto by a nut threaded onto said stud, said shaft being adapted to receive the hollow shaft of a grinder wheel to allow the grinder wheel to be lowered on to the upper end of the valve stem perpendicular to its length to grind the upper end of the valve stem.

3,577,689
METHOD FOR POLISHING METALLOGRAPHIC SPECIMENS

William F. Stuhrke, and Charles R. Underwood, Dayton, Ohio

Division of Ser. No. 730,831, May 21, 1968, filed Dec. 19, 1969, Ser. No. 889,863
Int. Cl. B24b 1/00
U.S. Cl. 51—281 2 Claims

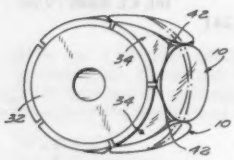


A metallographic specimen is moved in a figure-of-eight motion over a stiff paper supported by a hard backing surface on which the polishing compound is positioned at the crossover point of the figure-of-eight motion. The specimen is rotated about its axis after each predetermined number of motions. Apparatus is provided to give a continuous range of selectable pressures between the specimen and paper.

3,577,690
METHOD OF MAKING ONE-PIECE MULTIFOCAL LENS BLANKS

William M. Catron, 6900 Northwest 6th Court, Plantation, Fla.

Division of Ser. No. 688,454, Dec. 6, 1967, filed Aug. 4, 1969, Ser. No. 861,533
Int. Cl. B24b 1/00
U.S. Cl. 51—284 2 Claims



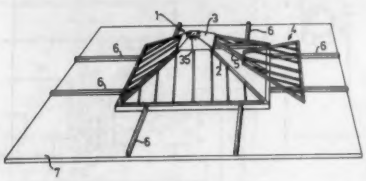
The method of manufacturing a multifocal lens blank which may finally be processed into a prescription lens having reading and distance portions separated by a shoulder extending the width of the lens, wherein a plurality of optical glass workpieces, specially shaped for efficient further processing, are blocked about the circumferential edge of a blocking wheel and auxiliary slabs of optical glass are provided in the spaces between adjacent pieces. During the grinding and polishing operations, which are performed on the workpieces to transform them to lens blanks, the auxiliary slabs provide the additional support needed by the processing tools to form relatively undistorted lens surfaces.

3,577,691
MOVABLE ROOF WINDOW HAVING A PYRAMIDAL FRAME CONSTRUCTION

Per Anders Persson, and Bror Lennart Sodersten, Stockholm, Sweden, assignors to Ruth L. Kallin, Uttran, Sweden

Filed Apr. 28, 1969, Ser. No. 819,638
Claims priority, application Sweden, June 17, 1968, 8186/68
Int. Cl. E04b 7/16; E04d 13/035
U.S. Cl. 52—72 10 Claims

A roof window includes support beams forming a pyramidal frame structure having an upper top roof and individually movable parallel trapezium-shaped roof or window sections. Each section can be moved between an open and a closed position, an upper guide extending between the base of a side of the pyramid and the top roof and a lower guide projecting outwardly from the said base being provided so as to cooperate with the upper and bottom portions, respectively, of the section. The guides form an angle with each other so that the section performs a combined displacing and swinging movement between its open and closed positions. Seals are provided between the sections and the frame structure. The lower guide is mounted or capable of being mounted on the roof of a building structure supporting the frame structure. The drive for the section may include a wire,

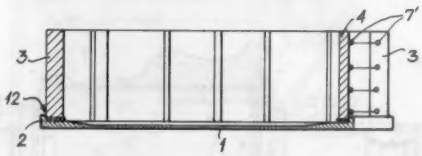


a chain or the like extending along the upper guide and connected with the upper portion of the sections and passing over end wheels arranged at the base of the frame structure or in the top roof. At least one of the wheels and preferably the one in the top roof is actuated by a drive motor. The seal includes sealing strips which extend along the side edges of the sections and cooperate with corresponding strips jutting from adjacent sections, said strips being of such configuration that, when the sections are in closed position, they present both an upper and a lower contact line with an insulating space therebetween. In the top roof is arranged a ventilation line provided with a fan which prevents misting or condensation in the region beneath the top roof when the sections are in closed position.

3,577,692
TANK STRUCTURE AND METHOD OF ERECTING SAME

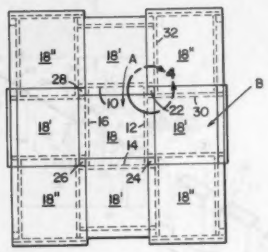
Oscar Sircovich, Harbaron Hirsch 9, Jerusalem, Israel

Filed July 15, 1968, Ser. No. 744,928
Claims priority, application Israel, Dec. 25, 1967, 29212
Int. Cl. E04c 3/10; E04b 1/14; E04g 11/04
U.S. Cl. 52—224 10 Claims



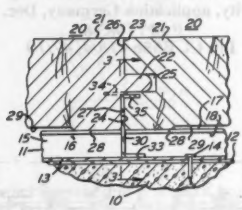
A concrete tank structure comprises a bottom slab, a plurality of inner and outer vertical columns arranged in circular arrays with each inner column spaced between and tied to a pair of outer columns, a plurality of wall panels each spanning one of the inner and one of the outer columns, and restraining means, preferably two or more cables, applied around all the outer columns for restraining their outward movement. According to a preferred method of erecting the tank and for introducing prestressing forces, a temporary structure is provided at the center and pulls inwardly on the inner columns before the restraining cables are applied to the outer columns.

3,577,693
CELLULAR BUILDING STRUCTURE
Uri Y. Sofer, Berkeley, and Irwin L. Kaltman, El Cerrito, Calif., assignors to Technology Consortium, Inc., Berkeley, Calif.
Filed Dec. 9, 1968, Ser. No. 782,215
Int. Cl. E04h 1/38, 1/04
U.S. Cl. 52—236 10 Claims



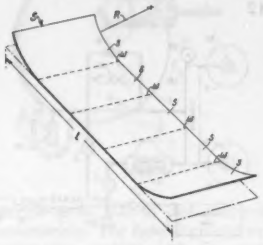
A building system containing a plurality of room-sized rectangular cells formed of panels and upright corner posts, each corner post providing vertical support for respective ends of up to four panels. The system possesses flexibility for expansion as well as versatility of design at low cost to the builder.

3,577,694
FLOORING SYSTEMS
Ray E. Omholt, Berwyn, Pa., assignor to Powerlock Floors, Inc., Philadelphia, Pa.
Continuation-in-part of application Ser. No. 534,371, Mar. 19, 1969, now abandoned, Continuation-in-part of application Ser. No. 724,799, Apr. 29, 1968, now abandoned. This application Aug. 18, 1969, Ser. No. 850,989
Int. Cl. E04b 5/00
U.S. Cl. 52—483 9 Claims



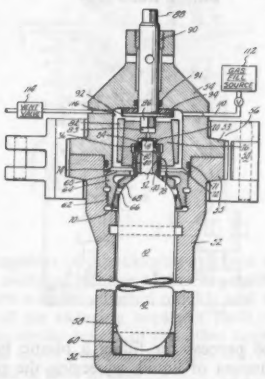
A flooring system utilizing standard pattern conventional tongue and groove wood floorboards, the boards being supported on transversely disposed spaced channels, metallic holding clips securing the boards in bearing engagement with the channels, the boards being free from any special slots for clip engagement, the clips engaging the boards in a driven penetrating relation below the tongues and grooves in a manner which does not interfere with the tight vertical engagement of the tongues and grooves nor cause splitting of the boards, the clips engaging the channels each having a body portion vertically disposed between the boards below the tongues and grooves and having at the upper margin of the body portion a horizontally extending toothed portion driven in fiber-penetrating engagement into the board along the edge at locations wholly below the lower margin of the tongue on the tongue side of the board, and optionally, for greatly increased holding power having a penetrating portion extending into the groove side of the board below the groove.

3,577,695
CONSTRUCTION OF HEATERS
Heinz W. Huybers, Ashtead, Surrey, England, assignor to Foster Wheeler Corporation
Filed Mar. 18, 1969, Ser. No. 808,279
Int. Cl. E04b 1/35
U.S. Cl. 52—745 6 Claims



This invention describes the construction of heaters in which chemical process streams are heated by making a composite sheet having the developed length of the cylindrical heater. The composite sheet is then rolled up rather like a "Swiss roll" to a size suitable for transport. Then on site the composite sheet is unrolled to a cylindrical shape to form one cylindrical section of the heater, the latter being formed by stacking a number of such sections one upon another.

3,577,696
METHOD OF FILLING A PRESSURE VESSEL ASSEMBLY
Herbert G. Bock, Farmington, and Walter J. Szerejko, Newington, Conn., assignors to Chandler Evans Inc., West Hartford, Conn.
Division of Ser. No. 758,904, Sept. 10, 1968, filed Apr. 29, 1969, Ser. No. 856,226
Int. Cl. B65b 31/02
U.S. Cl. 53—7 3 Claims



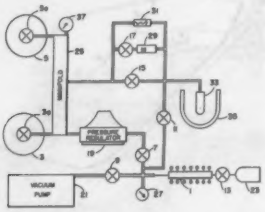
A metal high-pressure gas storage vessel has a threaded neck adapted to engage a threaded cap such that both cap and neck sealingly bear against an interposed seal element. The seal and cap are loosely assembled with the empty bottle and placed in a fluidtight filling fixture whereupon highly pressurized gas is introduced to the fixture, causing the bottle to fill by leakage between the loosely engaged threads. Then the cap is tightened and the fixture is vented prior to removal of the filled bottle. To lock the cap against rotation, the cap is locally upset into grooves in the neck after the acceptability of the charge has been verified.

3,577,697

HIGH-PRESSURE GAS-FILLING APPARATUS AND METHOD

Teddy J. Peacher, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

Filed July 1, 1969, Ser. No. 838,117
Int. Cl. B65b *31/00*
U.S. Cl. 53—12 **4 Claims**



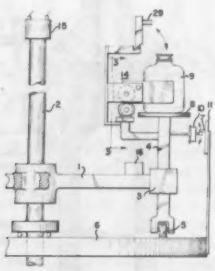
A high-pressure gas-filling apparatus and method for filling gas containers such as lamps to a positive pressure of several atmospheres to minimize waste of supply gas. Empty lamp bodies are attached to a filling manifold and the filling apparatus is evacuated to a desired pressure range before filling occurs. After the lamps have been filled and sealed, control valves are closed to trap unused supply gas in the system. The trapped gas is then liquified and collected in a freezeout chamber by applying cooling to the freezeout chamber. When cooling is discontinued, the liquified gas in the chamber revaporizes and when sufficient pressure builds up, the gas reenters the high-pressure supply side of the apparatus for reuse. Through the use of the freezeout chamber one of the supply containers can be purged, when its pressure will not operate a regulator, and the residual gas therein be placed into the other supply container.

3,577,698

METHOD AND MEANS FOR FILLING AND SEALING A FLEXIBLE CONTAINER

Herbert S. Ruckberg, Highland Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed June 11, 1968, Ser. No. 736,139
Int. Cl. B65b *3/04*
U.S. Cl. 53—37 **10 Claims**



A means and process for filling a plastic bottle with a premeasured amount of liquid, squeezing the plastic bottle until the level of liquid in the bottle comes to a predetermined height and then capping and sealing the bottle.

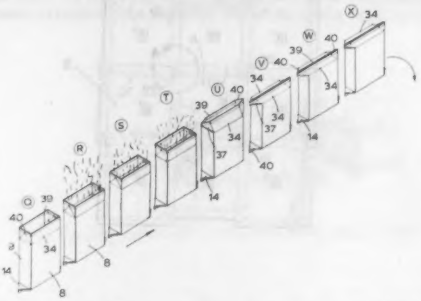
3,577,699

METHOD OF CARTONING

Stanley Milton Silver, 10 Blenheim Street, London, W. 1, England

Filed Sept. 4, 1969, Ser. No. 855,283
Claims priority, application Great Britain, Sept. 17, 1968, 44074/68
Int. Cl. B65b *1/58*; **B31b** *7/60, 49/02*
U.S. Cl. 53—27 **8 Claims**

A package is described wherein the contents are hermetically sealed in an inner lining of moisture resistant flexible sheeting material, which is wholly contained in a closed and sealed container of a substantially rigid material, such as boxboard, and yet the flexible sheeting initially constituted a layer sealed over the entire area of the board by means of a thermoplastic coating such as a microcrystalline wax. The lining remains sealed over a substantial area of the board after completion of the package. The package is rectangular and formed from a single unitary blank, the ends of the container being closed by flaps that have been severed from one another and, over the major portion of their area, detached



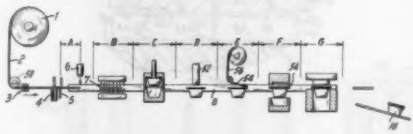
from the inner lining by the heating of the thermoplastic coating which is then absorbed in the boxboard material. The inner lining is sealed at each end by means of fin seals with web-gusseted ends. These are created by inwardly folding the ends of the container before the flaps are severed from one another, this initial folding involving gusset folding and the subsequent folding, after the severance of the flaps, being that of ordinary dust flaps and cover flaps. The fin seals are heat sealed when the heat is applied to strip the neighboring boxboard from the flexible material.

3,577,700

METHOD AND APPARATUS FOR PRODUCING CONTAINER PARTS FROM SHEET MATERIAL

Walter Bippus, Bensheim, and Horst Ackermann, Wiesbaden, Germany, assignors to Demag A.G., Duisburg, Germany

Filed Nov. 20, 1969, Ser. No. 878,282
Claims priority, application Germany, Dec. 20, 1968, P 18 15 983.6
Int. Cl. B65b *41/04, 47/10*
U.S. Cl. 53—30 **7 Claims**

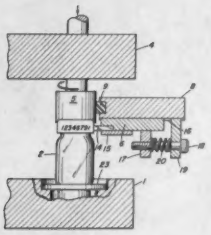


A method for the mechanical production of containers and container bottom parts includes the feeding out of a sheet of a material which is thermoplastically deformable and the indexing of the sheet past cutting, heating or molding, filling, covering and sealing apparatus to effect the deep drawing and filling and sealing of the container. The material is fed out and cut into a predetermined length from a web of such material and the individual cut portions are provided with raster holes by means by which the cut elements are centered in respect to the subsequent operations thereon. The apparatus for carrying out the method includes a conveyor having finger elements which are movable to engage in the raster holes of the individual cut elements and to move them to each additional working station and to center them at each station. The web material from which the molded containers are formed advantageously includes a printed distorted picture thereon for facilitating the centering and cutting thereon.

3,577,701
PRINTING AND CRIMPING ALUMINUM SEAL CLOSURES

George Spencer Bott, Westwood, N.J., and William Henry Marlow, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 31, 1968, Ser. No. 772,096
Int. Cl. B65b *61/26*; B67b *5/04*
U.S. Cl. 53—131 5 Claims

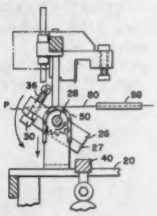


A process and apparatus for printing indicia by indentation on vial or bottle seal closures made of soft stock, such as aluminum. The marking is impressed on the closure while it is capped over a glass vial or bottle held in position with resilient chucks which turn the bottle, and thereafter while the bottles are still being turned the closure is crimped under the flange or shoulder of the bottle by rotating against a crimping or curling bar. The indicia may be letters or numbers.

3,577,702
BANDING MACHINE

Frederick Bescript, Cherry Hill, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Jan. 13, 1969, Ser. No. 790,587
Int. Cl. B65b *13/02*
U.S. Cl. 53—198 10 Claims



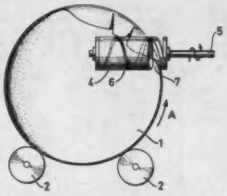
A banding machine wherein a strip of banding material is fed onto an article supported at a banding station. The article and the strip of banding material are gripped together and then given a revolving motion to cause the banding material to be wrapped completely around the articles. The wrapped portion of the banding material is then secured together in a wrapped condition by a heat sealing operation and served from the supply strip.

3,577,703
MEANS FOR FOLDING IN WRAPPING MATERIAL AT THE END OF AN APPROXIMATELY CYLINDRICAL ARTICLE

Karl Gustav Kohler, Folkungavagen, Sweden, assignor to Aktiebolaget Nordstroms Libanor, Stockholm K., Sweden

Filed Feb. 12, 1969, Ser. No. 798,620
Int. Cl. B65b *49/12*
U.S. Cl. 53—380 3 Claims

The invention is concerned with wrapping of a cylindrical article, such as a roll, for example a paper roll. Hence particularly, the invention relates to folding the end of the wrapping while rotating the wrapped cylinder. According to the invention there is provided a rotatable folding body having a helical groove or land surface extending around the periphery of said body and during the rotation of said folding body, abutting the wrapping material at the end of said

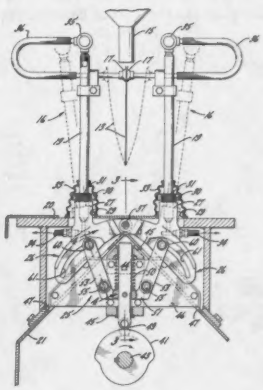


wrapped cylinder so as to fold in said material at said end substantially continuously. The helical groove or land surface may have a varying pitch and/or width, for example decreasing towards one end of the folding body.

3,577,704
PIVOT ASSEMBLY FOR MOUNTING SWINGABLE OPERATING MECHANISMS OF A PACKAGING MACHINE

Robert F. Lense, Rockford, Ill., assignor to Riegel Paper Corporation, New York, N.Y.

Filed Sept. 19, 1969, Ser. No. 859,306
Int. Cl. B65b *43/30*
U.S. Cl. 53—386 5 Claims



The bag openers of a packaging machine are mounted for in and out swinging relative to the bag path by a pivot assembly which may be adjusted quickly and easily to change the length of the swinging stroke of each opener independently of the stroke length of the other opener and without changing the home positions to which the openers swing at the inner ends of their strokes.

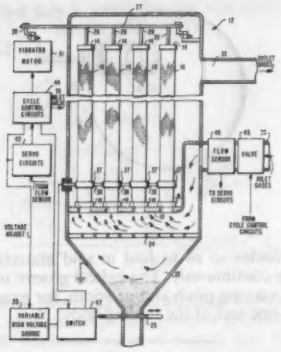
3,577,705
FILTER SYSTEM

Ian B. Sharlit, Los Angeles, Calif., assignor to Hitco

Continuation-in-part of application Ser. No. 627,914, Apr. 3, 1967, now abandoned. This application Dec. 23, 1968, Ser. No. 805,065
Int. Cl. B03c *3/36*
U.S. Cl. 55—4 19 Claims

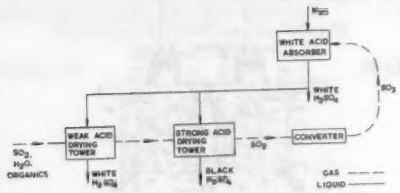
An air filtering system in which the filter elements through which the air passes are composed of an electrically conductive cloth having a high carbon content. The cloth is maintained at a substantial electrical potential relative to electri-

cal ground. The electrical charge is conducted to the particles present in the filter bag, thereby causing mutual repul-



sion and other effects between the charged particles and increasing the gas permeability of the filter system.

3,577,706
SULFUR DIOXIDE DRYING
Leopold Moller, Avonmouth, Bristol, England, assignor to Imperial Smelting Corporation (M.S.C.) Limited, London, England
Filed Aug. 30, 1968, Ser. No. 756,463
Claims priority, application Great Britain, Sept. 20, 1967, 42775/67
Int. Cl. B01d *53/14*
U.S. Cl. 55—30 **4 Claims**

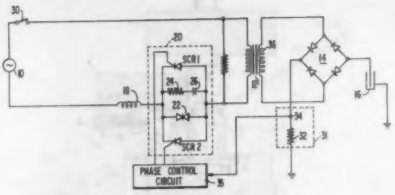


In the production of sulfuric acid, a two-stage drying process for drying gas which contains SO_2, organic material and water by contact with weak sulfuric acid of less than 70 percent strength to absorb a major proportion of the water but little of the organic material and then by contact with strong sulfuric acid to absorb the remaining water and the organic material.

3,577,707
SORPTION
Trevor Raymond White, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England
No drawing. Filed Dec. 19, 1969, Ser. No. 886,784
Claims priority, application Great Britain, Dec. 30, 1968, 61,660/68
Int. Cl. B01d *53/02*
U.S. Cl. 55—68 **9 Claims**

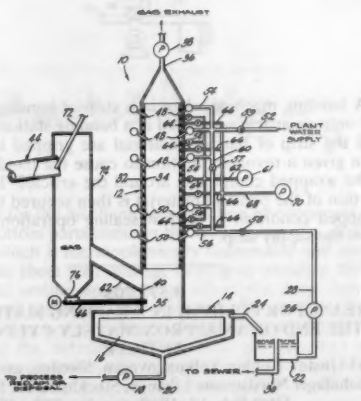
A process for sorbing nitrogen dioxide from a gaseous mixture with air, nitrous oxide or other gases by contact with a polyamide material such as polyhexamethylene adipamide in fibrous, powder or sintered form. The polyamide fibers may also be in bicomponent form wherein one component possesses potentially adhesive properties.

3,577,708
SPARK INTERVAL RESPONSIVE PRECIPITATOR VOLTAGE CONTROL
John W. Drenning, and Richard J. Bridges, Baltimore, Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.
Filed May 28, 1968, Ser. No. 732,615
Int. Cl. B03c *3/66*
U.S. Cl. 55—105 **28 Claims**



A method and digital circuit for modifying the voltage applied to the electrodes of a precipitator in accord with the elapsed time interval between the presently detected spark and the spark immediately preceding. Four predetermined time intervals are established by astable multivibrators each set by each detection of a spark in the precipitator. The outputs of the multivibrators enable gates to control the application of the next successive spark responsive pulse to a reversible digital counter which controls precipitator voltage. The counter is periodically advanced by clock pulses if the time interval between the detection of the next subsequent sparks falls outside the three shorter of the predetermined time intervals. Advancement of the counter is inhibited if the next subsequent spark responsive pulses occur within the second longest of the predetermined time intervals and the counter is respectively reversed one and two steps if the next subsequent spark responsive pulse occurs within the third longest or shortest of the predetermined time intervals.

3,577,709
GAS WASHER APPARATUS
John G. Hoad, Dearborn, Mich., assignor to John G. Hoad & Associates, Inc., Ypsilanti, Mich.
Filed May 9, 1968, Ser. No. 727,814
Int. Cl. B01f *3/04*
U.S. Cl. 55—228 **6 Claims**



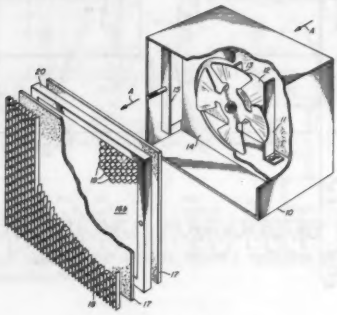
A combined wet scrubber and clarifier or settling basin for removing dust and other particulate matter from exhaust gases associated with various metallurgical and chemical processes.

3,577,710

AIR-TREATMENT APPARATUS

Elliot I. Feldman, 2850 E. Second St., Tucson, Ariz. 85716

Filed Sept. 30, 1968, Ser. No. 763,903
Int. Cl. B01d *53/04*
U.S. Cl. 55—316 3 Claims



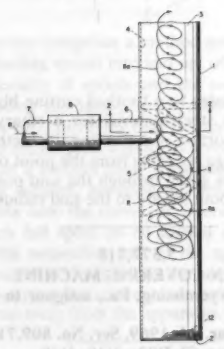
A reactant element for use in air-treating apparatus, including a honeycomblike structure having contiguous channels, the longitudinal axes of which are disposed parallel to the direction of airflow, particulate reactant material disposed within the contiguous channels and a frame which, with the honeycomb structure, forms a unitary cartridgelike assembly which is fully self-supporting in the direction of the airflow.

3,577,711

APPARATUS FOR REMOVING ENTRAINED PARTICLES FROM GASES

Luigi U. De Bernardo, San Dimas, Calif., assignor to the United States of America as represented by the Secretary of Agriculture

Continuation-in-part of application Ser. No. 592,888, Nov. 8, 1966, now abandoned. This application June 2, 1969, Ser. No. 829,125
Int. Cl. B01d *45/12*
U.S. Cl. 55—399 8 Claims



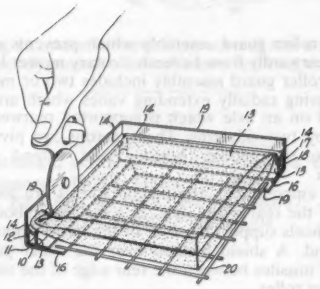
An apparatus for removing entrained particles from gases, of particular use as a spark arrester with internal combustion engines, comprises, essentially, an elongated cylinder, closed at one end and having a spiral member secured to the inner wall. Exhaust gases enter tangentially at a point near the open end and travel in a thin layer along a spiral path adjacent the wall toward the closed end. Near the closed end, the gases reverse direction and travel in an axial spiral path along the center of the cylinder and out the open end, while incandescent carbon particles continue by inertia in their original spiral path and are retained or pulverized by rubbing against the cylinder wall as they continue to circulate at the base of the cylinder. The absence of baffles minimizes back pressure on the engine.

3,577,712

COMBINATION AIR FILTER AND FRAME FOR HOLDING THE SAME

Peter Ballennie, deceased, late of West Hill, Eileen Margaret Ballennie, Executrix, West Hill, Ontario, Canada, and Angelo P. Ruffo, Montreal, Canada, assignors to Industrial Air Filters Limited

Continuation-in-part of application Ser. No. 683,197, Nov. 15, 1967, now abandoned. This application May 28, 1969, Ser. No. 829,163
Int. Cl. B01d *46/10*
U.S. Cl. 55—501 1 Claim



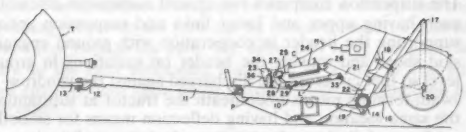
A frame comprising plural frame members in rectangular configuration for removably mounting air filter media. Each frame member has a base and a resilient wall in spaced apart relationship. A rigid finger extends downwardly from the rigid wall towards the resilient wall so that air filter media is gripped between the finger wall and the resilient wall. The frame member has a flange as an extension of the base portion.

3,577,713

HEADER LOCK MEANS FOR AGRICULTURAL HARVESTING MACHINES

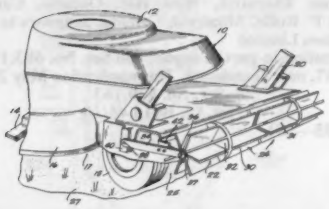
Horace G. McCarty; Henry N. Lausch, and Earl A. Hudson, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed July 26, 1968, Ser. No. 748,021
Int. Cl. A01d *43/10*
U.S. Cl. 56—11.9 9 Claims



This invention relates to a header locking means for agricultural harvesting machines having a mobile main frame, and a subframe and harvesting header mounted on the main frame. The subframe and header are mounted as a unit for pivotal movement relative to the main frame about a predetermined transverse axis between a lowered operating position and a fully raised nonoperating, transport or servicing position. Novel safety mechanical locking means in the form of a telescopic link assembly are provided to lock the header unit in a fully raised or intermediate position for various reasons including safety in transport or servicing of the header unit.

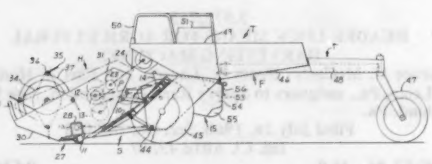
3,577,714
REAR ROLLER GUARD FOR ROTARY MOWERS
Einar S. Dahl, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of application Ser. No. 649,259, June 27, 1967, now abandoned. This application Aug. 27, 1969, Ser. No. 853,310
Int. Cl. A01d *75/20*
U.S. Cl. 56—17.2 21 Claims



A rear roller guard assembly which prevents ejection of missiles rearwardly from beneath a rotary mower blade housing. The roller guard assembly includes two or more paddle wheels having radially extending vanes which are rotatably supported on an axle which is supported rearwardly of the housing by two sidearms. The sidearms are pivotally connected to the mower housing and extend rearwardly therefrom.

In one embodiment, the paddle wheels are located rearwardly of the rear wheel axle. In a further embodiment, the paddle wheels support the rear of the mower housing above the ground. A shield located over the roller prevents the escape of missiles between the rear edge of the mower housing and the roller.

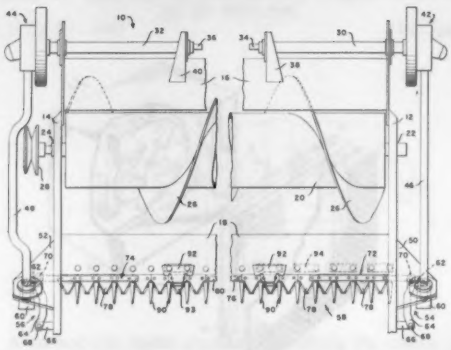
3,577,715
SUSPENSION FOR MOUNTING A HEADER ON A TRACTOR
Lawrence M. Halls, New Holland, and Henry N. Lausch, Leacock, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 3, 1969, Ser. No. 813,182
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 9 Claims



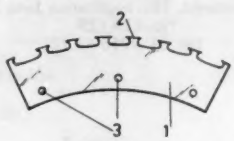
A self-propelled agricultural harvesting machine has a link-type suspension mounting a crop cutting header on a tractor. The suspension comprises two spaced suspension assemblies each having upper and lower links and suspension springs supporting the header in cooperation with ground engaging skid shoes and moving the header on variations in ground level so that cut crops are discharged against the windrow- or swath-forming means underneath the tractor at substantially the same location and having deflection means for smoothly guiding end discharged crops from the long conditioning rolls to the narrower windrow and swath forming means.

3,577,716
MOWING DEVICE
Horace G. McCarty, Leola; Lawrence M. Halls; Edmund O. Howell, New Holland, and Joseph C. Hurlburt, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Aug. 26, 1968, Ser. No. 755,318
Int. Cl. A01d *55/02*
U.S. Cl. 56—259 2 Claims

A mowing device comprising a frame structure, a split sickle mounted in the frame structure and drive means disposed on either side of said frame structure for independently driving each of said sickle halves so that the knife elements fixed to the sickle bars cut crop materials directed thereto across the entire length of the sickle.



3,577,717
CUTTING BLADE FOR ROTARY MOWER
Peter J. W. Van Den Munckhof, Meterikseweg 79, Horst, Netherlands
Filed Nov. 15, 1968, Ser. No. 776,211
Claims priority, application Netherlands, Nov. 16, 1967, 6,715,578
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 2 Claims

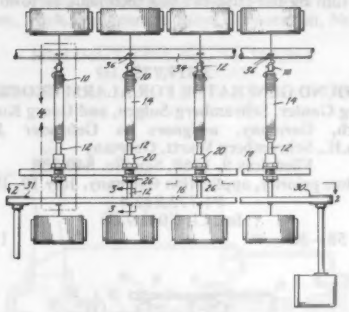


The invention relates to a toothed cutting blade manufactured of thin sheet steel material for a rotary mower and forming at least a portion of a flat ring, its teeth each having an active cutting edge receding from the point of the tooth in respect of the radius going through the said point and an inactive edge being about square to the said radius.

3,577,718
YARN-COVERING MACHINE
James J. Purcell, Wyomissing, Pa., assignor to Sheer Elastic Corporation
Filed Mar. 24, 1969, Ser. No. 809,716
Int. Cl. D02g *3/28, 3/38*
U.S. Cl. 57—18 3 Claims

A hollow spindle for the passage therethrough of a yarn to be covered, (herein referred to as the core), by another, (herein referred to as covering filament). The driving spindle of this invention is about double the length of a conventional spindle and it has an irreducibly small diameter. The covering filament is wound in the form of a long, small-diameter, cylindrical cake directly onto the spindle instead of on a bobbin which is mounted on the driving spindle. The spindle is rotated at a rate of speed about three times the rate attainable by conventional machines of this type. The spindle is

mounted for quick and easy removal and replacement and in a manner such that, replacing an empty spindle with a loaded



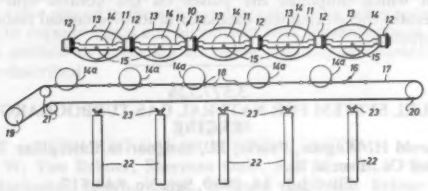
one will not disturb the closely spaced spindles of a multispindle installation.

3,577,719

METHOD AND APPARATUS FOR LOADING BOBBINS OR REELS INTO AND OUT OF CRADLES OR MOUNTINGS

Mario Martinez, Dibden Mannor, Dibden Hythe, and Colin Monday, Southampton, England, said Monday assignor to said Martinez

Filed Feb. 25, 1969, Ser. No. 802,096
Claims priority, application Great Britain, Mar. 12, 1968, 11,977/68
Int. Cl. D07b *3/12, 7/00*
U.S. Cl. 57—34 **13 Claims**



The invention comprises a method and apparatus for loading and unloading spools into and out of pintles of a machine having a plurality of spools and the method comprises the steps of loading full spools to be mounted in the supports onto a conveyor, conveying said full spools below said spool supports and locating each spool in a vertical plane displaced to one side of a vertical plane containing the respective axis of the spool support, lowering any empty spools from the spool supports onto the conveyor, operating the conveyor to position each full spool to be loaded in the vertical plane containing the respective axis of the spool support, raising each full spool to be loaded into the respective spool support and then operating the conveyor to convey unloaded empty spools thereon away from the apparatus.

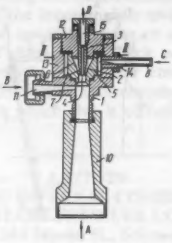
3,577,720

DEVICE FOR TWISTING YARN

Natan Albertovich Zax, B. Eldoradousky pereulok, 1, Kv. 35; Vasily Porfirievich Korzhov, Varshauskoe Shosse, 44/46, Korpus 3, Kv. 84, and Roza Semenovna Rabinovich, Dauyd Kouskaya ulitsa, 34, Korpus 45, Kv. 33, Moscow, U.S.S.R.

Filed Dec. 18, 1968, Ser. No. 784,768
Int. Cl. D01h *7/00*
U.S. Cl. 57—58.89 **2 Claims**

A yarn-twisting device is provided in which twisting single fibers fed into a spinning chamber is carried out by using the energy of an air vortex. The device is provided with means



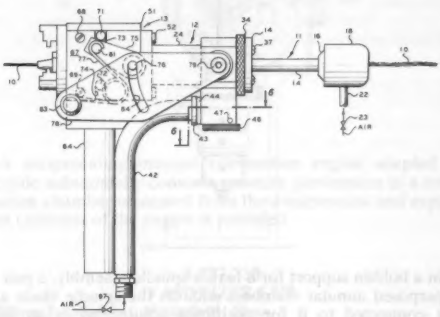
for creating an intensive vortical air current and a means ensuring a fine adjustment of aerodynamic spinning conditions.

3,577,721

YARN STRING-UP DEVICE

Hayes J. Schmick, and Hans Van Doornewaard, Greenville, S.C., assignors to Phillips Fibers Corporation

Filed Feb. 12, 1969, Ser. No. 798,667
Int. Cl. D01h *7/92;* **D02g** *1/04*
U.S. Cl. 57—77.33 **12 Claims**



A jet can be utilized to pass yarn through a deflection valve. The direction of rotation of the fluid in the jet and the resulting torque on the yarn can be varied to impart a desired amount of twist to the yarn. The deflection valve can pass the yarn to the next processing station or to waste, as desired, and cuts the yarn upon being charged from one condition to the other.

3,577,722

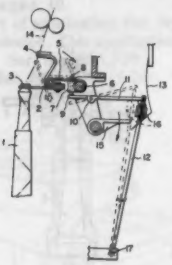
SENSING DEVICE FOR AUTOMATIC BRAKING OF THE SPINDLE IN RING SPINNING AND RING TWISTING MACHINES

Kazimerz Adamaszek, Komorowice Kreis Bielska-Biaej near, Poland

Filed Mar. 4, 1969, Ser. No. 804,152
Claims priority, application Poland, Mar. 7, 1968, P125,648
Int. Cl. D01h *13/16*
U.S. Cl. 57—80 **9 Claims**

A device which automatically regulates yarn tension including a lever upon which resultant yarn forces act and

which forces are counterbalanced by the weight distribution of the lever: a spindle brake actuator is held in an inactive



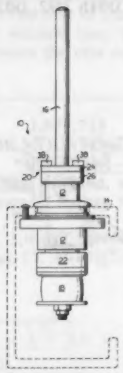
position until released by lever movement occasioned by yarn breakage.

3,577,723

BOBBIN SUPPORT FOR TEXTILE SPINDLE ASSEMBLY

John D. Page, Clemson, S.C., assignor to Maremount Corporation, Chicago, Ill.

Filed Sept. 2, 1969, Ser. No. 854,453
Int. Cl. D01h *7/16, 7/08*
U.S. Cl. 57—129 **10 Claims**



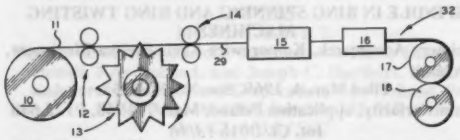
In a bobbin support for a textile spindle assembly, a pair of superposed annular members encircle the spindle blade and are connected to it for positional adjustment in an axial direction by connections of the spline and screw-thread types, respectively. Precise axial adjustment of the elevation of the annular members and of a bobbin mounted upon the spindle blade is made possible, and a nonslip driving connection between the blade and bobbin is provided.

3,577,724

METHOD OF FIBRILLATING AND TWISTING ORIENTED FILM

Max E. Greene, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 27, 1969, Ser. No. 793,996
Int. Cl. D02g *1/02*
U.S. Cl. 57—157 **5 Claims**



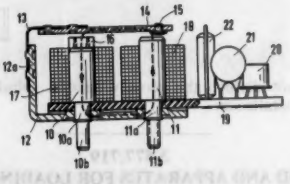
An apparatus and method for fibrillating and texturizing an oriented film of thermoplastic material. The apparatus includes a cutting roller rotatable about a fixed axis for cutting elongate slits in said film. The method comprises moving forming elongate slits in a thermoplastic film and texturizing said slit film by the false twisting technique to form a bulky yarn.

3,577,725

SOUND GENERATOR FOR ALARM CLOCKS

Wolfgang Ganter, Schramberg-Sulgen, and Georg Kunz, Lauterbach, Germany, assignors to Gebruder Junghans G.m.b.H., Schramberg Wurtt, Germany

Filed July 9, 1969, Ser. No. 840,238
Claims priority, application Germany, July 10, 1968, P1,773,812.4
Int. Cl. G04c *9/00*
U.S. Cl. 58—38 **11 Claims**



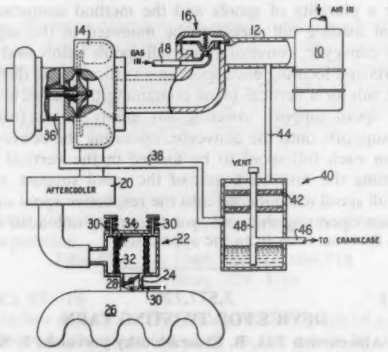
A sound generator for an alarm clock including a mechanical oscillator driven by a transistor circuit. The transistor circuit includes a drive coil on the output and a control coil on the input. The drive coil excites a mechanical oscillator which in turn varies the reluctance of the control coil. The drive and control coils are magnetically coupled together so that the circuit operates initially as a conventional blocking oscillator whose frequency depends upon the values of the circuit elements. Once the mechanical oscillator begins to move, however, the control coil reluctance is affected so as to convert the operation of the circuit into an amplifying circuit which amplifies the pulses on the control coil and operates the mechanical oscillator at its mechanical resonant frequency.

3,577,726

FUEL SYSTEM FOR NATURAL GAS TURBOCHARGED ENGINE

Harold H. Wagner, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 24, 1969, Ser. No. 844,517
Int. Cl. F02b *37/00;* **F02m** *21/04*
U.S. Cl. 60—13 **5 Claims**

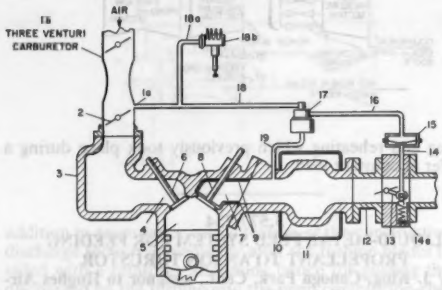


A turbocharged natural gas engine adapted for use with very low pressure gas by virtue of introducing the gas and combining it with air to provide a combustible mixture upstream of or on the low pressure side of the turbocharger. Safety means are provided to insure against damage by backfire and against admission of explosive gases to the engine crankcase.

3,577,727
METHOD OF REDUCING INTERNAL COMBUSTION ENGINE EMISSIONS

Joel A. Warren, Birmingham, and Frederick J. Marsee, Clawson, Mich., assignors to Ethyl Corporation, New York, N.Y.

Filed Oct. 7, 1968, Ser. No. 765,361
Int. Cl. F02b 75/10
U.S. Cl. 60—29 10 Claims



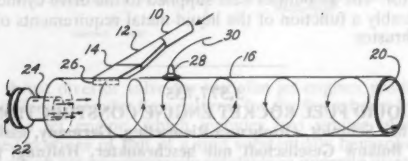
A system is described for reducing unburned hydrocarbons and carbon monoxide emitted from internal combustion spark ignition engines. The system comprises means for supplying a leaner-than-stoichiometric air/fuel mixture to the cylinders of the engine for combustion, means for conserving the heat of the exhaust products formed on combustion of the air/fuel mixture, and means for controlling the exhaust back pressure under low power demand. The means for conserving the exhaust heat includes the combination of an insulated exhaust port, insulated exhaust manifold and an insulated exhaust pipe; the back pressure control means consists of a valve placed in the exhaust pipe, said valve being responsive to vacuum signal and an exhaust back pressure signal.

A method of operating an engine utilizing said system is also described.

3,577,728
EXHAUST GAS PROCESSING SYSTEM

Joe W. Von Brimer, Sherman Oaks, and Herman P. Roth, Manhattan Beach, Calif., assignor said Von Brimer to General Scientific Laboratories, Inc., a fractional part interest

Continuation of application Ser. No. 601,468, Dec. 13, 1966, now abandoned. This application Mar. 19, 1969, Ser. No. 809,480
Int. Cl. F01n 3/10
U.S. Cl. 60—30 27 Claims

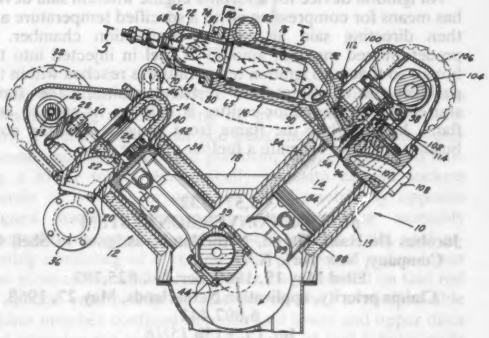


An exhaust gas processing device for use with internal combustion engines which is generally of the afterburner type, including a cylindrical reactor in which the unburned hydrocarbons are consumed and an exhaust pipe connected near one end of the cylindrical reactor in such manner as to direct the flow of gases tangentially into the reactor to produce a vortical flow pattern to assure adiabatic heating and mixing with air from outside the reactor chamber. Various arrangements are described for igniting the mixture in the chamber, for controlling the effective area of the exhaust gas inlet to the reactor and the air inlet to the reactor, for controlling the reactor outlet including additional air mixing means, for compounding the reactors and for using a plurality of reactors for multicylinder engines. Arrangements are also shown for utilizing the heat radiating from the sides of the reactor to heat the incoming air and for conserving the heat by means of an insulating layer or a labyrinth structure which redirects the exhaust flow back across the outside of the reactor cylinder. A still further embodiment utilizes a helical member within the reactor chamber to direct the flow in a vortical pattern which also is effective to reduce sound output.

3,577,729
RECIPROCATING INTERNAL COMBUSTION ENGINE WITH CONSTANT PRESSURE COMBUSTION

Glenn B. Warren, 1361 Myron St., Schenectady, N.Y.

Filed Mar. 11, 1969, Ser. No. 806,159
Int. Cl. F02g 3/02
U.S. Cl. 60—39.63 11 Claims

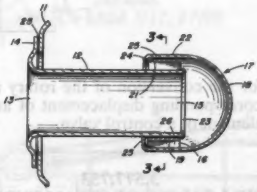


A reciprocating internal combustion engine adapted to provide substantially constant pressure combustion in a combustion chamber separated from the compression and expansion cylinders of the engine is provided.

3,577,730
VAPORIZER CUP

William J. Oliphant, Wakefield, Mass.

Filed July 25, 1969, Ser. No. 844,958
Int. Cl. F23d 11/44
U.S. Cl. 60—39.71 3 Claims

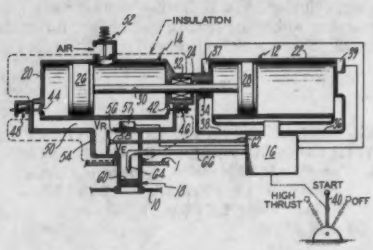


A vaporizer for gas turbine engines formed of three simple parts, a tube, a retaining band and an end cup joined inseparably together to control the passage of the air/fuel mixture through 180° and to vaporize the mixture of contact of the mixture with the forward head plate of the combustion chamber.

3,577,731
ENGINE IGNITION SYSTEM

Raymond J. Bruchez, Jr., Lake Park, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 1, 1969, Ser. No. 846,833
Int. Cl. F02c *7/26*
U.S. Cl. 60—39.82 **11 Claims**

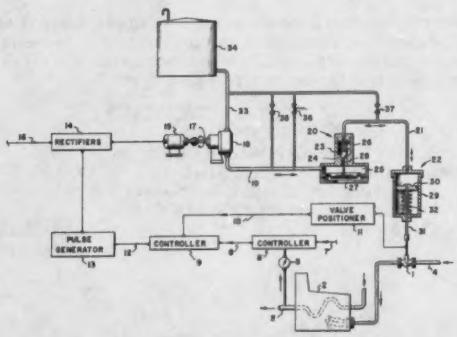


An ignition device for a turbine engine wherein said device has means for compressing air to a specified temperature and then directing said air into a combustion chamber. A predetermined metered amount of fuel in injected into the hot air so that auto ignition temperature is reached within the passageways of a catalytic restrictor-emitter. The flame started by the restrictor-emitter is held on its surface as a flame holder while the flame front projects into the combustion chamber to ignite a fuel/air mixture.

3,577,732
MOTION CONVERSION SYSTEM

Jacobus De Haas, Haren, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed May 19, 1969, Ser. No. 825,782
Claims priority, application Netherlands, May 27, 1968, 6,807,442
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 **7 Claims**



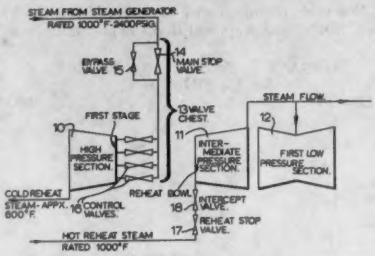
A system for the conversion of the rotary movement of a shaft into a corresponding displacement of an element such as a moving element of a control valve.

3,577,733
RAPID LOADING OF STEAM TURBINES

Eric Manuel, Peterborough, Ontario, Canada, and James H. Moore, Jr., Scotia, N.Y., assignors to General Electric Company

Filed May 8, 1969, Ser. No. 822,933
Claims priority, application Canada, July 16, 1968, 25,244
Int. Cl. F01k *13/02*
U.S. Cl. 60—105 **3 Claims**

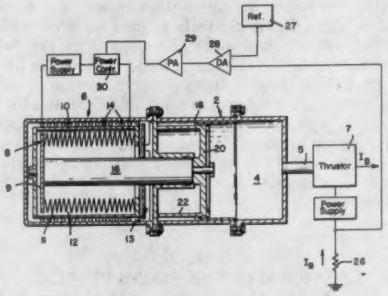
A method for loading a steam turbine and transferring from full arc to partial arc admission during loading while maintaining a constant rate of heating, so as to eliminate the cooling and reheating which previously took place during a transfer at constant load.



3,577,734
LIQUID-METAL FEED SYSTEM FOR FEEDING PROPELLANT TO AN ION THRUSTOR

Harry J. King, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 602,664, Dec. 19, 1966, Pat. No. 3,443,383.
Filed July 19, 1968, Ser. No. 746,114
Int. Cl. F03h *5/00*
U.S. Cl. 60—202 **2 Claims**



A reservoir of liquid metal is connected to an ion thrustor for a supply of ionizable material thereto. The reservoir is in the form of a reservoir cylinder having a reservoir piston therein. An associated drive cylinder contains a drive piston connected to the reservoir piston. A liquid in equilibrium with its vapor is positioned in the drive cylinder, and as heat is added, the pistons move to deliver liquid metal to the thrustor. The amount of heat supplied to the drive cylinder is preferably a function of the liquid-metal requirements of the ion thrustor.

3,577,735
LIQUID FUEL ROCKET ENGINE CONSTRUCTION

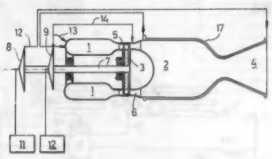
Gunther Schmidt, Ottobrunn-Riemerling, Germany, assignor to Bolkow Gesellschaft mit beschrankter, Haftung, Ottobrunn, Germany

Continuation of application Ser. No. 698,574, Jan. 17, 1968, now abandoned. This application Nov. 5, 1969, Ser. No. 871,644
Int. Cl. F02k *9/02;* **F01d** *9/04*
U.S. Cl. 60—207 **6 Claims**

A liquid fuel rocket engine construction includes the usual main combustion chamber having a nozzle discharge. One or more precombustion chambers are arranged ahead of the main combustion chamber in a position to discharge combustion gases generated therein through turbine blades of an auxiliary turbine arranged directly adjacent the rear end of the main combustion chamber. The auxiliary turbine drives at least two separate fuel component pumps, one of which

discharges first through the walls of the main combustion chamber for cooling purposes and then into a precombustion chamber, and the other of which discharges only partially into the precombustion chamber and then into the discharge from the auxiliary turbine and into the main combustion chamber. The precombustion chamber is operated either with excess fuel or oxidizer.

The construction includes a preguide lattice or guide fin arrangement for discharging into the turbine blades and in



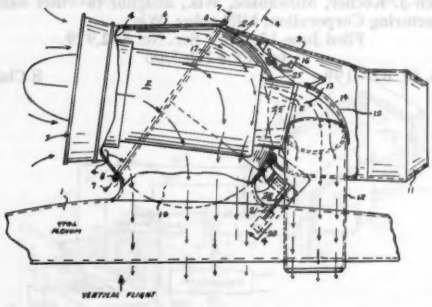
addition in accordance with a feature of the construction, the discharge section immediately after the turbine blades is provided with a retarding afterguide lattice for guiding the fuel discharged by the turbine into the main combustion chamber and also for adding an additional fuel component, either fuel or oxidizer, at such location. In a preferred form, the trailing ends of the afterguide lattice are provided with nozzle discharge openings for facilitating the discharge of the fuel component into the main combustion chamber at such location.

3,577,736

THRUST DIVERTER VALVE

Emerson W. Stevens, Snyder, N.Y., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Aug. 21, 1969, Ser. No. 852,010
Int. Cl. F02k *1/20*
U.S. Cl. 60—226 **8 Claims**



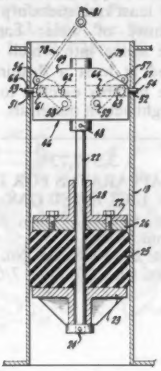
A thrust diverter valve for turbofan jet engines producing two different angular flow patterns for the fan exhaust from a turbofan jet engine, which includes two similar spherical curved portions of half of a split substantially hemispherical shell which are concentrically rotatable in opposite directions in a confining chamber around the axis of a turbofan jet engine with the axis of rotation of each portion of the shell disposed in canted relation with respect to horizontal and vertical flow directions. The spherical shell portions are rotatable about their axis in opposite directions into one position in the path of flow from the fan to form an inclined hemispherical deflector shell and deflect the flow from the fan downwardly at substantially 90° to the fan axis for vertical thrust, and movable about their axis in the opposite directions out of the flow path from the fan and allow the fan flow to pass between the spherical shell portions parallel to the axis of the turbofan jet, without deflection, to provide for horizontal thrust.

3,577,737

WATERTIGHT PLUG FOR TUBULAR PILE WELLS

Hulbert M. Burleson, P.O. Box 301, Russellville, Ala.

Filed Apr. 14, 1969, Ser. No. 815,829
Int. Cl. E02b *17/04*; **E16l** *55/00*; **E21b** *23/06*
U.S. Cl. 61—46.5 **5 Claims**



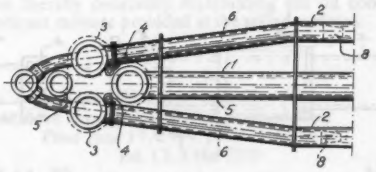
The invention comprises, in combination with a platform for supporting an oil-drilling rig in offshore-drilling operations, a plurality of tubular pile wells anchored in underwater ground and supporting said platform; each of said wells having a lower set of diametrically opposite aligned sockets therein as well as an upper set of diametrically opposite aligned sockets therein, a watertight plug assembly removably mounted in each of said tubular wells, said assembly consisting of a central axially disposed rod, a lower disc mounted on said rod, an upper disc mounted on said rod in spaced relationship to said lower disc, a compressible rubber member confined between said lower and upper discs and engaging the inner surface of each of said tubular wells to prevent passage of water thereby, a first set of pins movably mounted in said upper disc of said assembly; sad pins being adapted to be moved into the lower set sockets of said pile wells, a setting block fixedly mounted on said rod and a second set of pins movably mounted in said block; said second set of pins being adapted to be moved into said upper set of aligned sockets of each of said pile wells to lock said lower disc against displacement.

3,577,738

APPARATUS FOR INJECTING SAND BENEATH SUBMERGED CONSTRUCTIONS

Kaj Havno, Copenhagen, Denmark, assignor to Christiani & Nielsen A/S, Copenhagen, Denmark

Filed June 9, 1969, Ser. No. 831,302
Claims priority, application Denmark, June 18, 1968, 2854/68
Int. Cl. E02d *3/12*, *27/00*
U.S. Cl. 61—63 **4 Claims**



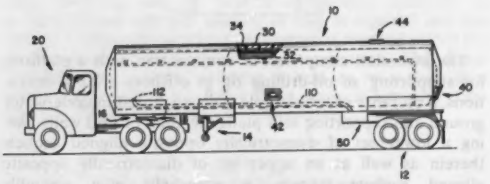
Apparatus for injecting sand under a construction or excavation in the water in which the construction is temporarily

suspended or rests on temporary supports comprising combined feed and suction pipes each having a branch adapted to extend beneath the construction and a branch extending vertically above the surface of the body of water; means for reciprocating or oscillating the branches beneath the construction and including a feedpipe through which a mixture of sand and water can be pumped into the space below the construction, and at least one suction pipe through which a corresponding quantity of water can be extracted or withdrawn from the space into which sand and water are being deposited, and at least a flushing feedpipe through which water can be forcibly ejected to flush suspended or partially deposited lightweight materials.

3,577,739
METHOD AND APPARATUS FOR TRANSPORTING LIQUEFIED GAS

Lawrence A. Botkin, Omaha, Nebr., assignor to Freuhauf Corporation, Detroit, Mich.

Filed Oct. 29, 1968, Ser. No. 771,550
Int. Cl. F17c *5/02, 7/02*
U.S. Cl. 62—45 **16 Claims**

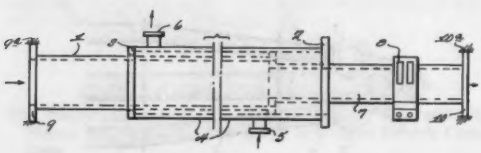


A movable pressure vessel has an insulated wall portion for limiting the temperature rise of liquefied gas therewithin. A relief valve is provided for limiting the pressure within the vessel to establish a working pressure. The filling means of the vessel includes a relief valve for limiting the maximum pressure of the gas entering the vessel to a pressure of approximately 15 p.s.i.g. less than the working pressure of the vessel. Liquefied gas is loaded into the vessel at a maximum temperature and pressure as determined by the relief valve in the filling means, and temperature rise of the liquefied gas during transport is limited so that the pressure produced by the gas does not exceed the working pressure of the vessel. A vapor return means extends along the bottom of the vessel and opens therewithin at a point remote from the outlet means of the vessel and adjacent the front end of the vessel.

3,577,740
VIBRATED REFRIGERATED SURFACE

Jeffrey Stuart Kenworthy, and Hans Berthhold Wiener, Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 11, 1969, Ser. No. 849,066
Claims priority, application Great Britain, Sept. 5, 1968, 42217/68
Int. Cl. F25c *1/12*
U.S. Cl. 62—72 **12 Claims**

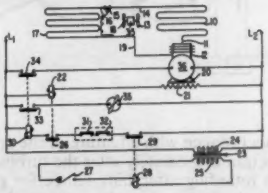


Apparatus for chilling a liquid to produce a slurry includes three coaxial lengths of tube meeting in a junction, one of them being torsionally sonically vibrated and another, which chills the liquid, contacts the liquid on one of its sides and a refrigerant on the other. Extremities of the lengths of tube are supported at nodal points and the junction is at an antinodal point if the vibrated and chilling lengths of the tube are of different diameters. The design is robust whilst avoiding large losses of sonic energy.

3,577,741
REFRIGERATION APPARATUS

David N. Shaw, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed June 2, 1969, Ser. No. 829,417
Int. Cl. F25b *43/02*
U.S. Cl. 62—84 **2 Claims**

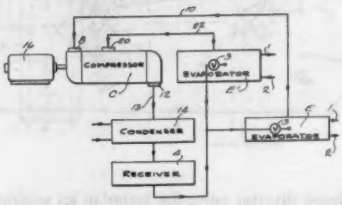


A refrigeration circuit comprising a motor-driven compressor, a condenser, an evaporator, and expansion means. The compressor includes an oil reservoir, where a supply of oil is disposed for lubricating the compressor during normal operation thereof. Associated with the compressor is a heating element, operable to heat the oil when the compressor is inoperable. A safety switch prevents the compressor from becoming energized if the heating element has not functioned while the compressor was inoperable.

3,577,742
REFRIGERATION SYSTEM HAVING A SCREW COMPRESSOR WITH AN AUXILIARY HIGH PRESSURE SUCTION INLET

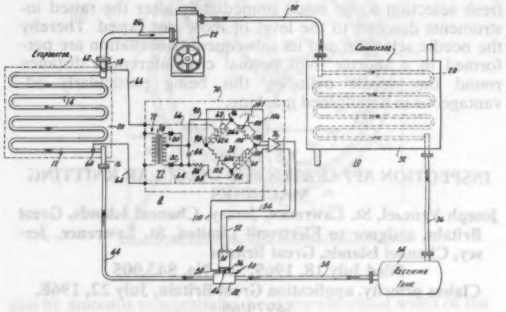
Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed June 13, 1969, Ser. No. 832,979
Int. Cl. F25b *5/00*
U.S. Cl. 62—199 **8 Claims**



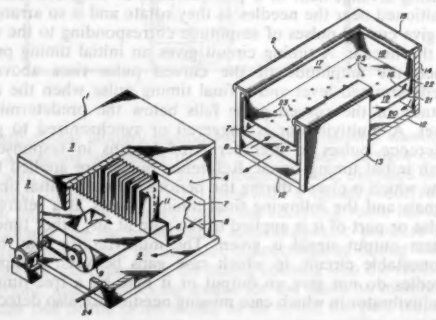
A refrigeration system having a screw compressor for compressing low pressure suction gas that is received from an evaporator and compressing it and discharging it into a condenser; including an auxiliary high-pressure suction inlet to the compressor for conducting high-pressure suction vapor from a pressure-reducing means and to the compressor for being compressed along with low-pressure suction vapor. The invention is used with a refrigeration system having either two operating suction pressure levels, or having a single suction level. The high-pressure suction vapor is introduced into the compressor at a point after the low-pressure suction is cut off, and therefore no reduction in the low-pressure suction capacity results. Increased compressor capacity is thus accomplished by the addition of this high pressure vapor.

3,577,743
CONTROL FOR REFRIGERATION SYSTEMS
Joseph N. Long, Wauwatosa, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.
Filed June 10, 1969, Ser. No. 831,873
Int. Cl. F25b *41/00*
U.S. Cl. 62—212 8 Claims



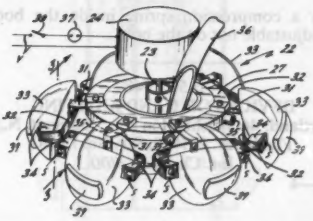
A control system for a refrigeration system employs first and second temperature sensors located in the system evaporator to control the superheat condition of the system refrigerant. One temperature sensor senses the temperature of liquid phase refrigerant in the evaporator while the other temperature sensor senses the temperature of gaseous phase refrigerant in the evaporator. The temperature sensors are connected to a differential temperature control means which regulates the system expansion valve in accordance with a desired differential temperature or superheat condition between the liquid and gaseous phase refrigerant.

3,577,744
DRY AIR REFRIGERATED DISPLAY CASE SYSTEM
John F. Mercer, P.O. Box 143, Globe, Ariz. 85501
Filed Dec. 29, 1969, Ser. No. 888,289
Int. Cl. A47f *3/04*; F25b *5/00*
U.S. Cl. 62—256 4 Claims



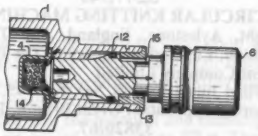
In order to provide an open refrigerated display case in which the product zone remains frost-free and in which the evaporator coils remain ice-free, a small secondary evaporator unit is utilized to dry ambient air which is stored under pressure and metered into the air flow path of the primary cooling system. The display case is coilless, the depressed temperature being maintained primarily through conduction panels forming the bottom and walls of the product zone, which conduction panels are disposed in intimate contact with the refrigerated air supply from the primary evaporator unit. Apertures through the conduction panels are provided to leak cold dry air into the product display zone to attain spillage at a low rate. System efficiency is increased by providing baffles to insure intimate contact of the dry refrigerated air against the thermally conductive panels comprising the walls as well as the bottom panel of the product zone.

3,577,745
ICE MAKING APPARATUS
Elmer W. Zearfoss, Jr., Philadelphia, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.
Filed May 23, 1969, Ser. No. 827,239
Int. Cl. F25c *1/10*
U.S. Cl. 62—345 7 Claims



Centrifugal ice-freezing apparatus including a plurality of flexible or otherwise deformable molds or pockets disposed in circular array, and having open portions presented radially inwardly toward a central axis about which they are rotatable. Means is provided for filling the pockets, and for rotating them to retain water therein by centrifugal force. While rotating, the molds are flexed and pivoted to ice freezing position, and are subjected to below freezing temperatures until the water is frozen. Upon freezing of the water, rotation is halted to accommodate both flexing and pivoting of the molds to ice ejecting position.

3,577,746
SELF-CONTAINED LUBRICATION SYSTEM FOR HIGH SPEED DRIVE SHAFT COUPLING
Clarence F. Dolan, Erie, Pa., assignor to General Electric Company
Filed Jan. 29, 1969, Ser. No. 795,116
Int. Cl. F16d *3/06*
U.S. Cl. 64—23 1 Claim

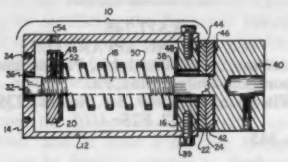


A self-contained lubrication system for a splined high speed drive shaft coupling. One of the splined shafts is coated with a mixture of a solid lubricant and grease. A grease reservoir is mounted on one of the shafts to replenish the lubricant required at the spline surfaces. Rotation of the shafts forces the oil in the grease from the reservoir onto the spline surfaces thereby constantly replenishing the oil content of the lubricant mixture provided at the spline surfaces.

3,577,747
TORQUE LIMITING CLUTCH
James Murrell Brown, Box 1388, Levelland, Tex.
Filed June 17, 1969, Ser. No. 833,955
Int. Cl. F16d *7/00*
U.S. Cl. 64—29 3 Claims

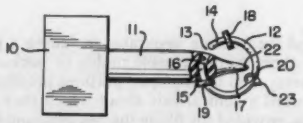
A self-aligning, adjustable torque-limiting clutch has a can-shaped body which is attached to the driving shaft. A bolt is attached to the driven shaft and the bolt extends through the body and journaled at each end thereof for alignment sup-

port. One serrated plate is attached to the body and another serrated plate to the bolt and the serrated plates are held



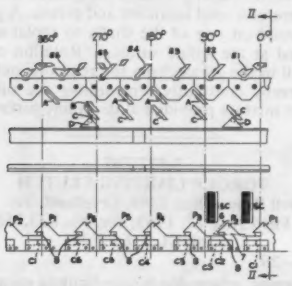
together by a compression spring inside the body, acting against an adjustable nut on the bolt.

3,577,748
DEVICE FOR HAND KNITTING
Dena S. Nortland, 46 Washington Ave., Dumont, N.J.
Filed Mar. 2, 1970, Ser. No. 15,681
Int. Cl. D04b *3/00*
U.S. Cl. 66—4 **6 Claims**



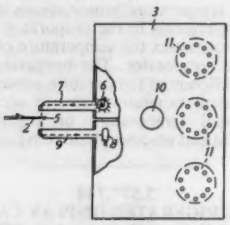
A device for use in knitting by hand which includes a bar adapted to be held in one hand and having a series of aligned posts on which are mounted yarn-receiving members respectively. The said members have oppositely disposed confronting ends which are spaced apart to provide openings therebetween. The yarn-receiving members are mounted on the posts for relative movement to dispose said members in any one of three positions, namely a position in which said openings between the confronting ends of said members are closed, a position in which passageways into said members are provided on one side of the posts respectively and a position in which passageways are provided on the opposite side of the posts respectively. Means is also provided forming stops for limiting the movement of said yarn-receiving members respectively.

3,577,749
CIRCULAR KNITTING MACHINES
Dennis Wright, Aylestone, England, and Thomas Adams, West Knighton, England, assignors to The Bentley Machine Development Company Limited
Filed July 18, 1968, Ser. No. 745,753
Claims priority, application Great Britain, July 22, 1967, 33820/67
Int. Cl. D04b *15/32, 15/68*
U.S. Cl. 66—50 **4 Claims**



A needle selecting system in a circular knitting machine employing rockable selecting instruments cooperating with needles in the needle cylinder tricks, such instruments being adapted to be projected from their tricks and to have particular ones depressed selectively to miss a raising cam which the others engage, wherein the instruments are controlled by cam means so organized that instruments which through being depressed have remained at low level are rocked to project them out of their tricks before the remaining instruments raised by the raising cam have been subsequently lowered to the low level, means being provided to cause a fresh selection to be made immediately after the raised instruments descend to the level of those not raised. Thereby the needle selection and its subsequent cancellation are performed in a shorter than normal circumferential distance round the needle cylinder, this being particularly advantageous in a multifeed machine.

3,577,750
INSPECTION APPARATUS FOR CIRCULAR KNITTING MACHINES
Joseph Venczel, St. Lawrence, Jersey, Channel Islands, Great Britain, assignor to Electronit Limited, St. Lawrence, Jersey, Channel Islands, Great Britain
Filed July 18, 1969, Ser. No. 843,005
Claims priority, application Great Britain, July 22, 1968, 34979/68
Int. Cl. D04b *35/18*
U.S. Cl. 66—157 **7 Claims**

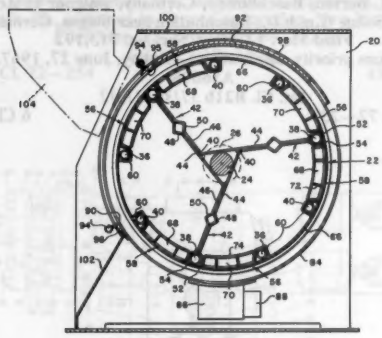


Inspection apparatus in combination with a circular knitting machine, the apparatus performing the function of detecting a broken knitting needle and giving an alarm or stopping the machine in response to such detection. A sensing arrangement of a photoelectric or magnetic kind is positioned near the needles as they rotate and is so arranged to give curved pulses of amplitude corresponding to the size of the needle. A timing circuit gives an initial timing pulse when the amplitude of the curved pulse rises above a predetermined level and a final timing pulse when the amplitude of the curved pulse falls below the predetermined level. A multivibrator is triggered or synchronized to give reference pulses to predetermined lengths in response to each initial timing signal. Reference pulses are applied to a gate which is closed during the periods between initial timing signals and the following final timing signals. If a reference pulse or part of it is applied to the gate at any other time an alarm output signal is given. The multivibrator may be a monostable circuit, in which case gaps between groups of needles do not give an output or it may be a free-running multivibrator in which case missing needles are also detected.

3,577,751
THREE-COMPARTMENT SIX-DOOR WASHER AND EXTRACTOR
Max Hertig, and Peter J. Meier, Syracuse, N.Y., assignors to G. A. Braun, Inc., Syracuse, N.Y.
Filed Feb. 13, 1969, Ser. No. 798,973
Int. Cl. D06f *37/08, 37/10*
U.S. Cl. 68—143 **2 Claims**

Laundry washer and extractor having a perforate wash drum rotatable on a horizontal axis, partitions within the drum dividing the drum into three like compartments, separate access doors for each compartment disposed adjacent each compartment partition, and a surrounding stationary shell for retaining wash and rinse water, and having a

sump and rain valve and having an arcuate doorway in one side thereof extending from levels above and below the drum



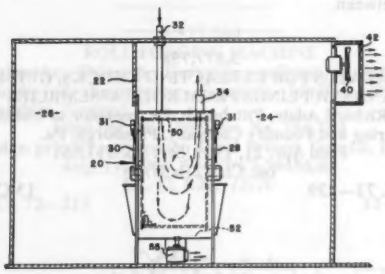
axis by amounts substantially the circumferential width of the drum doors, and a door for the arcuate shell doorway.

3,577,752

LAUNDRY APPARATUS

Max Hertig, and Peter J. Meier, Syracuse, N.Y., assignors to G. A. Braun, Inc., Syracuse, N.Y.

Filed Nov. 12, 1968, Ser. No. 775,088
Int. Cl. D06f *39/14*
U.S. Cl. 68—210 **4 Claims**



Institutional laundry equipment including laundry washing and extracting apparatus having a substantially airtight casing, with separate loading and unloading doors, disposed in a partition dividing a laundry area into a laundry-receiving room and a clean laundry room, the receiving room having an exhaust fan for maintaining subatmospheric pressure in the receiving room, an air duct connecting the casing with outside air, port means in the casing opening into the receiving room, and interlocking means for the doors to maintain at least one of the doors closed at all times, the port means being either an air duct or a casing water dump valve open to the receiving room or both.

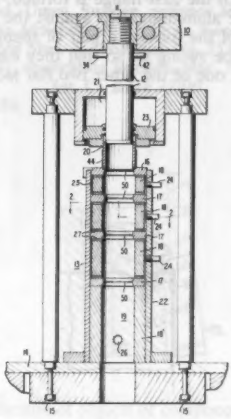
3,577,753

METHOD AND APPARATUS FOR FORMING THIN-WALLED CYLINDRICAL ARTICLES

Dipak C. Shah, Bethlehem, and Louis S. Schwartz, Schnecksville, Pa., assignors to Bethlehem Steel Corporation

Filed Sept. 30, 1968, Ser. No. 763,715
Int. Cl. B21d *22/28, 37/16, 37/18*
U.S. Cl. 72—41 **5 Claims**

A method and apparatus for forming thin-walled containers from flat blanks is disclosed herein. The flat blanks are precoated with a dry film lubricant and drawn and ironed through a series of dies. Apparatus is provided to prevent the



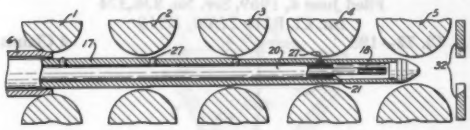
thermal breakdown of the lubricant comprising an internally fluid-cooled punch and fluid-cooled dies.

3,577,754

PROCESS AND APPARATUS FOR ROLLING SEAMLESS TUBES

Albert H. Calmes, 4, Avenue DuJaman, Lausanne, Switzerland

Division of Ser. No. 421,845, Dec. 29, 1964, Pat. No. 3,394,568.
Filed May 14, 1968, Ser. No. 728,938
Claims priority, application Great Britain, Sept. 9, 1964, 36988/64
Int. Cl. B21b *45/02, 27/10, 17/04*
U.S. Cl. 72—45 **6 Claims**



A hollow metal blank is rolled forward upon an advancing hollow tapered mandrel to reduce the wall thickness of the blank in longitudinally-spaced steps and thereby elongate it and form gaps around the mandrel between those steps. Lubricant is forced into the mandrel and discharged laterally from it into at least one of said gaps to fill it. The lubricant is prevented from flowing from the gaps back into the mandrel as the gaps are shortened by the advancing mandrel, so the shortening of the gaps with their restricted rear ends increases the pressure on the lubricant above the supply pressure.

3,577,755

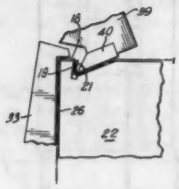
SLEEVE FOR PROTECTING THE PEG IN THE HEAD OF A CARBON ANODE ELECTRODE AND APPARATUS FOR PRODUCING THIS SLEEVE

Karl Fricker, Meilen, Zurich, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 582,117, Sept. 26, 1966.
Filed Dec. 24, 1968, Ser. No. 786,571
Int. Cl. B21d *39/02*
U.S. Cl. 72—51 **4 Claims**

Sleeve-forming apparatus comprising a former of rectangular section around which a strip of sheet aluminum is arranged to be bent to form the sleeve or tube and which has three smooth faces for forming the three flat walls of the tube and a fourth face formed with a V-shaped groove extending

parallel to the edges of the former with the base of the groove adjacent to that face of the former over which the wall of the tube which will carry the part of the fourth wall of the tube on which the first flange is formed, a pressure jaw for clamping the aluminum strip against the middle of the three flat faces of the former, a pair of shaping jaws which are arranged to be swung up so that they each closely embrace a different one of the other two flat faces and part of



the grooved face of the former in order to bend the strip which is clamped by the clamping jaw against one flat face of the former along the other two flat faces of the former and over the grooved face of the former, and an element having a folding edge which is arranged to be swung against the grooved face of the former so that the folding edge enters the V-shaped groove and forms the first flange and the inclined portion and second flange on the edges of the strip by forcing them into the groove of the former.

3,577,756

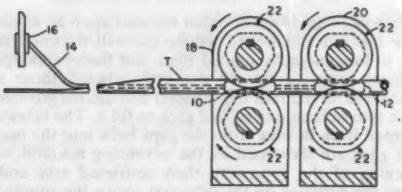
TWO-PASS WELD BEAD FINISHING PROCESS FOR PIPE AND TUBING

James E. Cramer, Rte. 6, Box 118, Burlington Township, Racine County, Wis.

Filed June 4, 1969, Ser. No. 830,374

Int. Cl. B21b *21/00, 17/10*

U.S. Cl. 72—193 **4 Claims**



This invention relates to apparatus for removing an internal weld bead from longitudinally welded metal tubing during longitudinal movement of the tubing. The apparatus has a plurality of spaced-apart plugs each positioned axially within the tubing and having a diameter portion in simultaneous contact with the weld bead and an opposite internal surface area of the tubing. Separate means are associated with each plug for sequentially applying a compressive force to the tubing over an external surface area thereof adjacent the plug to compress the tubing against the contacting diameter portions of the plug. During force application the plug moves axially a distance with the tubing. The plug is flexibly anchored which permits it to return to its original position upon release of the compressive force.

3,577,757

ROLLER FRAME STRUCTURE WITH ONE OR MORE PRESSING DEVICES FOR MAINTAINING CONSTANT THE GAP BETWEEN THE ROLLERS

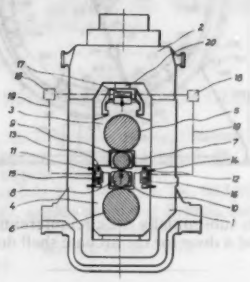
Ernst H. Barten, Buschhutten, Germany, assignor to Achenbach Sohne G.m.b.H., Buschhutten near Siegen, Germany

Filed Mar. 14, 1968, Ser. No. 713,192

Claims priority, application Germany, June 27, 1967, A56096

Int. Cl. B21b *31/30, 31/32*

U.S. Cl. 72—237 **6 Claims**



Roller frame in which the rollers are urged toward each other under a certain preload as by a threaded spindle with hydraulic piston-cylinder means acting between the rollers in separating direction. The pistons bottom in the cylinders at a predetermined point and the cylinders are supplied with fluid under pressure in conformity with the movement of the rollers away from each other when a strip is passing therebetween.

3,577,758

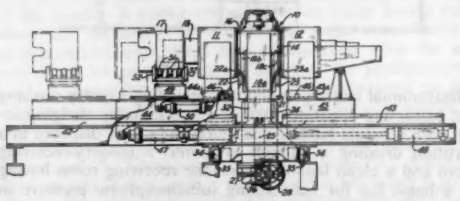
APPARATUS FOR EXTRACTING CHOCKS, GUIDES, AND COUPLINGS FROM ROLL ASSEMBLIES

James Richard Adair, Pittsburgh, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.

Filed Apr. 21, 1969, Ser. No. 817,881

Int. Cl. B21b *31/08*

U.S. Cl. 72—239 **13 Claims**



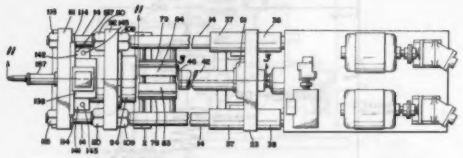
The roll-disassembling apparatus disclosed is provided with saddle surfaces to support a roll assembly by engaging neck portions on the roll which are located between the bearing chocks and roll body. These saddle surfaces form part of a cradle assembly that is vertically movable to locate a roll assembly that is vertically movable to locate a roll assembly at a desired elevation where disassembling thereof takes place. At each side of the roll body there is provided a movable car having latches to support and extract a rest bar along with a roll guide mounted thereon. A coupling member at one end of the roll assembly is extracted by a movable carriage having a coupling support platen that may be elevated by a screwjack. The bearing chocks are next extracted from the roll journals by displaceable sleds, each having a chock support platen that may be elevated by a screwjack. The carriage used to remove the coupling member is independently supported by one of the chock-extracting sleds.

3,577,759

METHOD OF AND APPARATUS FOR PREPARING COPPER AND BRASS BILLETS FOR EXTRUSION INTO HOLLOW SHELLS

Paul Tandler, Clayton, Mo., and Ellis R. Blackwell, East St. Louis, Ill., assignors to Cerro Corporation, New York, N.Y.

Filed Mar. 13, 1968, Ser. No. 712,857
Int. Cl. B21c *23/01*
U.S. Cl. 72—254 13 Claims



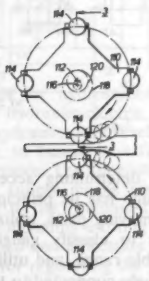
This invention is concerned with a prepiercing and scalping method, in which the billet is precompressed, pierced and scalped, in a substantially continuous closely controlled operation, in a single press, for the purpose of preparing the billet for subsequent extrusion in an extrusion press. The method is designed to prevent distortion or deflection of the piercing mandrel, prevent the wear and tear encountered in the conventional extrusion cycle, and to save time. Provision is made for removal of the slug or breakout resulting from the prepiercing operation, as well as to sever the scalped material into easily removable segments or parts. The invention is further concerned with a press of novel construction for performing the method.

3,577,760

ROLL FORGING MACHINE

Rolf Franke, Osterath, Germany, assignor to Brightside Foundry & Engineering Company Limited, Sheffield, Yorkshire, England

Filed Dec. 18, 1968, Ser. No. 784,784
Claims priority, application Great Britain, Dec. 18, 1967, Aug. 17, 1968, 57417/67;39456/68
Int. Cl. B21b *13/20*
U.S. Cl. 72—215 12 Claims



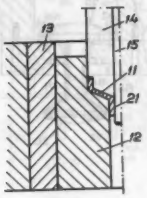
A forging machine comprising at least two roll carriers arranged on opposite sides of material to be reduced. Each roll carrier includes a bush having one or more arms attached thereto. Work rolls are arranged in the ends of the arms. The roll carriers are moved in noncircular paths, the paths being somewhat flattened when engaging the material to be reduced. The machine also includes means for altering the distance between the work rolls in the flattened portion of their paths.

3,577,761

METHOD OF MANUFACTURING COMPONENTS FROM A PART PROJECTING FROM A LARGER PART, HAVING SLIM AND/OR ELONGATED FORM

Eskil Monestam, Umea, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Mar. 4, 1968, Ser. No. 711,829
Claims priority, application Sweden, Mar. 7, 1967, 3082/67
Int. Cl. B21c *23/00*
U.S. Cl. 72—256 2 Claims



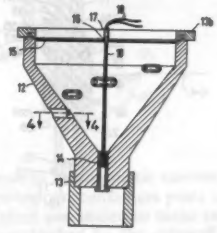
In the manufacture of objects or components with one part having larger dimensions and one part having slim and/or elongated form, a billet is used which in a first step is forged, preferably cold-forged to a blank with decreasing cross section. This blank is thereafter, possibly after annealing and machining, extruded by means of liquid pressure to the desired shape and dimension at the narrow end of the blank.

3,577,762

METHODS AND DEVICES FOR THE DYNAMIC TESTING OF MATERIALS

Erhard Hornbogen, Gottingen; Erwin Niessner, Neuenburg, Baden, and Gert Buck, Bad Uberkingen, Germany, assignors to Buck K. G., Bad Uberkingen, Germany

Filed Mar. 27, 1969, Ser. No. 811,053
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 7 Claims



A conical housing is provided with a stick of explosive disposed axially within the housing. The apex angle of the housing is chosen so that a shock wave front produced by igniting the explosive is tangential to an internal conical wall of the housing. A plurality of measurement sites are disposed over the internal wall and specimens to be tested are mounted therein. The stick of explosive is ignited and the resulting distortion of the specimens is observed.

3,577,763

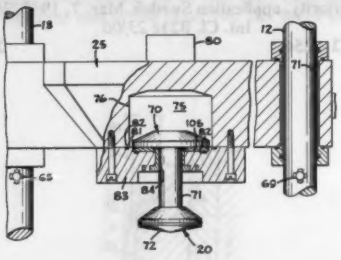
APPARATUS FOR SELECTIVELY PROGRAMMING DIFFERENT TYPES OF SHOCK TESTS

John O. Beal, Pacific Grove, Calif., assignor to Monterey Research Laboratory, Inc., Monterey, Calif.

Filed June 2, 1969, Ser. No. 829,405
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 7 Claims

Apparatus for selectively programming different types of shock tests in which a movable shock table is moved toward

a reaction mass. A programmer in series with the shock table and the reaction mass controls the shock pulse produced by the impact between the shock table, the programmer and the



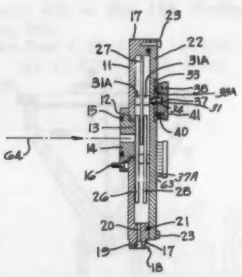
reaction mass. The movable shock table is formed with a gas filled chamber. The programmer includes a piston and an elastomer assembly. The piston is received by the gas filled chamber formed in the movable shock table.

3,577,764

TARGET HOLDING CONTROL UNIT

Abraham L. Korr, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of the Army

Filed Aug. 14, 1969, Ser. No. 850,129
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 **6 Claims**



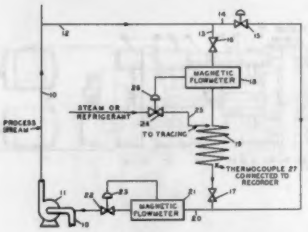
A multitarget holding control unit for collecting specimens from a particle accelerator arrangement normally operating under a vacuum condition to enable performance studies in the hypervelocity impact phenomena of accelerated small solid particles having a size on the order of 10^{14} cm. in diameter. A cup-shaped housing has its base secured to the hub of a centrally apertured adapter for sealed connection to a particle accelerator arrangement. A plurally apertured cover, sealingly secured to an outward face of the cup peripheral sidewall, supports respective target plate shafts, index means and control knob. Within the completely sealed unit, a plurality of overlapping and longitudinally spaced target plates are arranged on their shafts such that a peripheral target space on each target plate disc can be simultaneously aligned with the adapter aperture. Each of the peripheral targets on each plate is provided with an electrical conductive means to collect electrical charges carried by particles and controllingly delivered through the adapter aperture to the peripherally mounted target.

3,577,765

APPARATUS FOR DETERMINING CRYSTALIZATION TEMPERATURE

Joseph Bertoglio, Collinsville, Ill.; Philip L. Deming, St. Louis, Mo.; Joyce G. Eckert, Columbia, Ill., and James R. Shafer, Bridgeton, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 26, 1967, Ser. No. 693,211
Int. Cl. G01n *1/00*
U.S. Cl. 73—17 **6 Claims**



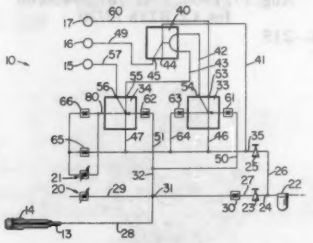
Method and apparatus for automatically determining the crystallization temperature of a flowing liquid. Temperature control means are adapted to vary the liquid viscosity within a crystallization zone. Changes in flow or pressure drop caused by the viscosity changes provide the basis for temperature control. Because operation of the system is cyclic, the effects of heat of crystallization of the liquid can be observed on a recording of crystallization zone temperature, thus identifying the crystallization temperature.

3,577,766

FLUIDIC GAGE

John H. Walker, Dayton, Ohio, assignor to The Bendix Corporation

Filed Jan. 23, 1969, Ser. No. 793,270
Int. Cl. G01b *13/10*
U.S. Cl. 73—37.9 **18 Claims**



A fluidic gauge for determining acceptability of workpieces wherein such gage has its principal operating components made free of moving parts, utilizes a pair of pneumatic trigger switches to classify gauging signals into a predetermined acceptable range, and utilizes on-off type indicating means operatively connected to the trigger switches to indicate the character of each workpiece being checked.

3,577,767

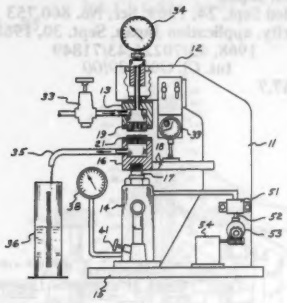
FELT PERMEABILITY TESTING APPARATUS

Udino Stedile, Pinnerolo, Italy, assignor to Beloit Corporation, Beloit, Wis.

Filed Nov. 24, 1969, Ser. No. 879,289
Int. Cl. G01n *15/08*
U.S. Cl. 73—38 **2 Claims**

Various permeability characteristics of a sample of felt or other permeable web materials are determined by testing ap-

paratus comprising a pair of interchangeable platens between which the sample is subjected to controlled compression as a measured flow of liquid is forced through the sample from



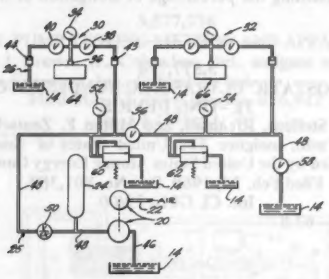
one platen to the other along a predetermined flow path established by the particular pair of platens installed in the apparatus.

3,577,768

HYDROSTATIC TESTING APPARATUS

Theophil Aprill, Jr., and John R. Leerkamp, Ann Arbor, Mich., assignors to A & L Battery & Electric Service, Inc., Ann Arbor, Mich.

Filed Sept. 2, 1969, Ser. No. 854,614
Int. Cl. G01m *3/26*
U.S. Cl. 73—40.5R **14 Claims**



Portable apparatus for hydrostatically testing hydraulic equipment such as hydraulic-electric and air-over-oil car, truck and bus lifts, hydraulic dock leveling devices, hydraulic docks, and the like, to ensure its safe functioning and for preventative maintenance. The apparatus includes a reservoir for hydraulic fluid, supply means for supplying hydraulic fluid under pressure to the equipment being tested, a pressure gauge assembly including a fitting for connection to the equipment being tested and a pressure gauge in communication with the fitting for registering the pressure in the equipment, and valve means for isolating the gauge and the fitting from the supply means.

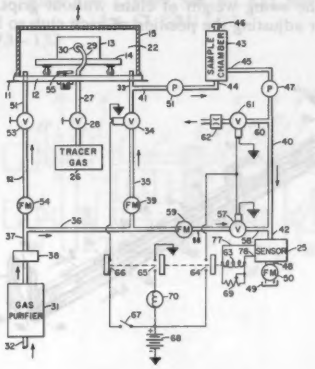
3,577,769

LEAK-DETECTION SYSTEM

John Alfred Roberts, Lynnfield Center, Mass., assignor to General Electric Company

Filed Apr. 2, 1969, Ser. No. 812,710
Int. Cl. G01m *3/20*
U.S. Cl. 73—40.7 **10 Claims**

Leak-detecting apparatus having an enclosure for a container to be tested providing a sample gas accumulator. The container is charged with a tracer gas which in the case of a leak, flows into the accumulator from which it is pumped through a sample gas conduit to a gas sensor sensitive to the tracer gas. The sensor activates valves to supply a purging gas



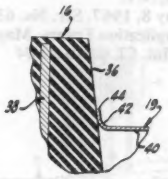
to the sample gas conduit to purge the sensor thereby cutting of all flow of tracer gas to the sensor. This occurs before saturation of the sensor thereby preventing saturation with the resultant long recovery time.

3,577,770

TEST-CLOSURE FOR OPEN-TOPPED CONTAINERS

Stanley B. Shaw, Sunol; Ronald H. Gehl, and Gordon R. Roemer, Fremont, Calif., assignors to C T Supply Co., Fremont, Calif.

Filed May 5, 1969, Ser. No. 821,793
Int. Cl. G01m *3/32*
U.S. Cl. 73—49.8 **7 Claims**



A test closure for use in an automatic can-testing machine operative to test open-topped containers prior to their being filled with a food product and sealed to make certain that an airtight chamber is established by the sidewall and bottom closure attached thereto. The test closure includes a thick resilient pad engageable with the angularly disposed, outwardly flared rim of such container to establish an hermetic seal therewith. The face of the test closure pad engageable with the container rim has an angular disposition essentially corresponding to that of the rim so as to be engageable with a relatively wide surface portion thereof.

3,577,771

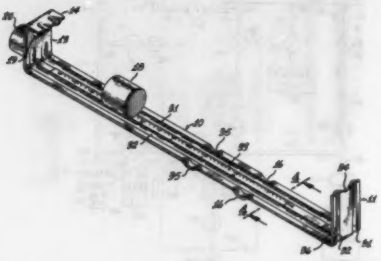
SWING-WEIGHT AND STATIC WEIGHT BALANCE FOR GOLF CLUBS

Karsten Solheim, 10412 North 37th St., Phoenix, Ariz.

Filed Aug. 30, 1968, Ser. No. 756,535
Int. Cl. G01m *1/12*
U.S. Cl. 73—65 **9 Claims**

Apparatus for measuring swing weight and static weight of golf clubs adapted to employ a table or counter top as a base is provided by an elongated rigid member having: a first upright section at one end thereof to support a golf club shaft; a second upright section at the other end to hold the grip end of the club; and two longitudinally displaced rockers

functioning as fulcrums between the two end sections. The position of a balance weight is adjusted to balance the rigid member on one rocker with a golf club held by the upright sections with the shaft supported by the first upright section and extending away from the second upright section. For measuring the swing weight of clubs without grips, there is provision for adjusting the position of each club so held relative to the upright sections depending on the length of its shaft. For measuring static weight, the club is held with its shaft transverse the elongated rigid member at the one end thereof and balance is obtained on the second rocker by adjusting the position of the balance weight. Swing weight or static weight is then read on a scale from the position of the balance weight, depending upon which rocker is used.

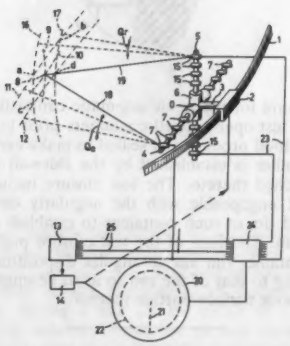


3,577,772

DEVICE FOR DIAGNOSTIC EXAMINATION BY ULTRASONIC OSCILLATIONS

Jean Perihou, Bourg La Reine, and Michel Joseph Auphan, Neuilly Sur Seine, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1967, Ser. No. 637,000
Claims priority, application France, May 6, 1966, 60559
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.7 **8 Claims**



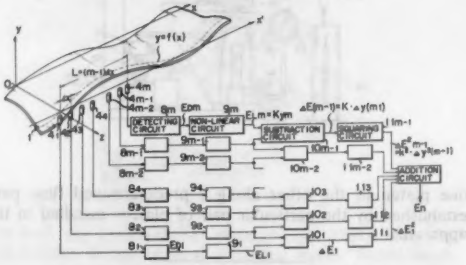
An ultrasonic device for examining the internal parts of the body comprising a plurality of ultrasonic transmitters mounted along a horizontal line on a movable carriage and triggered sequentially. A plurality of receivers is mounted on the carriage along a vertical line that intersects the horizontal line at right angles. The movement of the carriage is synchronized with the deflection of an electron beam in a PPI cathode-ray tube to provide a visual display of the surface contour of the internal body part under investigation.

3,577,773

METHOD AND APPARATUS FOR MEASURING THE PERCENTAGE OF ELONGATION OF METAL STRIPS

Moritada Kubo, Tokyo, and Kuniji Asano, Kawasaki-shi, Japan, assignors to Tokyo Shibawra Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 24, 1969, Ser. No. 860,753
Claims priority, application Japan, Sept. 30, 1968, Oct. 4, 1968, 43/70226;43/71849
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.7 **9 Claims**



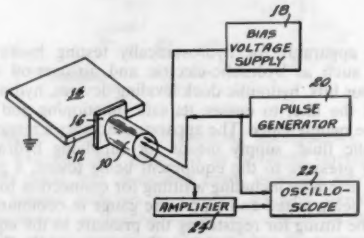
The percentage of elongation of a rolled metal strip is measured by apparatus comprising a plurality of spaced apart magnetic or ultrasonic detectors which are disposed along a line parallel to the direction of movement of the metal strip and not in contact therewith. Signals produced by adjacent pairs of detectors are compared to obtain difference signals which are squared and then added together to provide a signal representing the percentage of elongation of the metal strip.

3,577,774

ELECTROSTATIC ULTRASONIC NONDESTRUCTIVE TESTING DEVICE

Robert W. Steffens, Richland, and Milton F. Zeutschel, Bellevue, Wash., assignee The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 24, 1969, Ser. No. 801,389
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.8 **1 Claim**



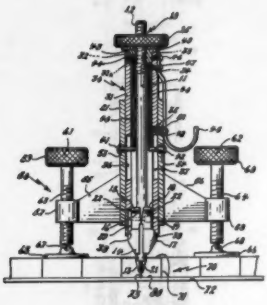
An ultrasonic device for nondestructively testing an electrically conductive sample comprises an electrode mounted to said sample and electrically insulated therefrom. Means are provided for generating a pulsed potential difference between the sample and the electrode to generate an elastic wave in the sample. A bias voltage is applied to the electrode and an oscilloscope is used to detect, relative in time to the applied pulsed potential difference of the electrode, changes in the bias potential of the electrode response to the elastic wave.

3,577,775

BOND LINE TEST TOOL

Albert G. Henderson, Hereford, Md., assignor to The United States of America as represented by the Secretary of the United States Air Force

Filed June 17, 1969, Ser. No. 833,911
Int. Cl. G01n 19/04
U.S. Cl. 73—95 2 Claims



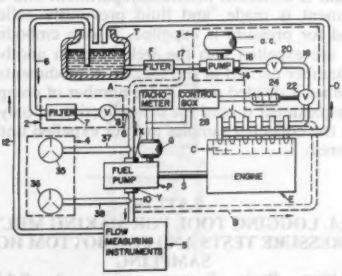
A tool for testing the integrity of a bond line at the interface of the skin and core of a honeycomb panel structure. The tool includes, as major components, means for gripping a wall of a core cell of the honeycomb panel, means for applying a controlled tensile pull to the bond line at the skin-to-core interface by pulling on the gripped core cell wall, and means for supporting and guiding the gripping means and the tensile pull means.

3,577,776

FUEL PUMP TESTING METHOD AND APPARATUS

Thomas J. Brown, Jr., Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed May 22, 1969, Ser. No. 826,912
Int. Cl. G01m 15/00
U.S. Cl. 73—119A 7 Claims



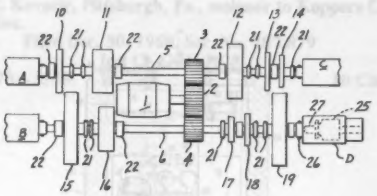
Method and apparatus for testing and calibrating a fuel pump of the type used in "common rail" fuel systems for diesel engines. The fuel pump remains mounted on and driven by the engine. The method involves disconnecting the pump from the injectors, or other fuel delivery means of the engine, and connecting the pump to flow measuring apparatus. The pump remains mounted on and driven by the engine, and the engine in turn receives fuel for its operation from a second fuel pump. An important requirement of the test apparatus is that the pump to be tested must be driven at various controlled speeds. This is accomplished by means for controlling the pressure output of the second fuel pump.

3,577,777

INERTIA SYSTEMS FOR DYNAMOMETERS

Ray W. Whelan, Redwood City, and Edmond J. Atelian, San Carlos, Calif., assignors to Western Gear Corporation, Lynwood, Calif.

Filed Apr. 1, 1969, Ser. No. 812,200
Int. Cl. G01l 5/28
U.S. Cl. 73—133 4 Claims



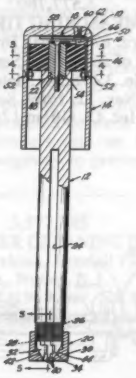
An inertia system for supplying a predetermined amount of energy through a rotating shaft to a dynamometer or like apparatus to permit testing various devices such as brakes. The system includes rotatably supported inertia elements on preferably two shafts connected together by a gear train to permit a substantially infinite variation of inertia and at the same time reduce the required strength of the torque transmitting gearing by employing a connecting gear train.

3,577,778

TORQUE MEASURING TOOL

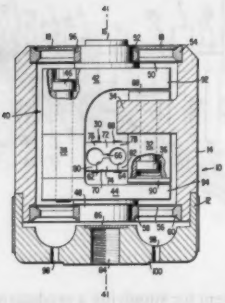
Gunar Liepins, 1215 Wines Drive, Ann Arbor, Mich.

Filed July 1, 1969, Ser. No. 838,228
Int. Cl. G01l 5/24
U.S. Cl. 73—139 9 Claims



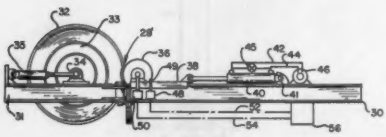
A torque wrench which is particularly adapted for supporting an Allen-type wrench and for indicating the torque that is applied. A shaft is provided on one end of which is mounted a chuck, the shaft being slotted to permit insertion of the Allen-type wrench through the chuck. A hollow transparent plastic handle is connected to the other end of the shaft by an elastomeric coupling, and a torque indicator mechanism extends between the shaft and the handle and is visible through the transparent handle to indicate the torque applied to the Allen-type wrench.

3,577,779
CONSTANT MOMENT BEAM TRANSDUCERS
Eric Laimins, Belmont, Mass., assignor to BLH Electronics Inc., Waltham, Mass.
Filed Mar. 14, 1969, Ser. No. 807,190
Int. Cl. G01l 1/22
U.S. Cl. 73—141 5 Claims



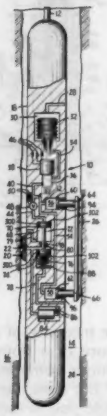
A strain-responsive force transducer includes a constant moment parallelogram-type cantilever-beam unit equipped with strain gages wherein the cantilever-beam unit is held fixed at one end to a support and has a movable end rigidly secured to a force-applying member, guided by spaced diaphragms, the cantilever-beam unit being directly connected between the support and force-applying member without auxiliary flexure provisions and accommodating relative movement between the force-applying member and support with minimum attendant nonlinearities in electrical outputs developed by the strain gages.

3,577,780
METHOD OF MEASURING TIRE UNIFORMITY
Lawrence R. Sperberg, 6740 Fiesta Drive, El Paso, Tex. 79912
Continuation-in-part of application Ser. No. 608,344, Jan. 10, 1967, now Patent No. 3,478,581, dated Nov. 18, 1969. This application Nov. 12, 1969, Ser. No. 875,763
Int. Cl. G01m 17/02
U.S. Cl. 73—146 7 Claims



A tire uniformity machine having means for rotatably mounting a pneumatic tire and a test wheel on an elongated frame and wherein the outer periphery of the test wheel is held adjacent the outer periphery of the tire with a predetermined pressure. The elongated frame is hinged on each side and provided with axially rotatable means to enable the test wheel to be aligned with the buttress area or sidewall of the tire, in addition to the conventional location adjacent the tread. The test wheel is provided with strain gauges and the diameter of the test wheel with respect to the diameter of the tire is held between the limits of 1:30 and 1:4, with the ratio of 1:16 being ideal or optimum.

3,577,781
TOOL TO TAKE MULTIPLE FORMATION FLUID PRESSURES
Maurice P. Lebourg, and Roger Q. Fields, Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Filed Jan. 10, 1969, Ser. No. 790,321
Int. Cl. E21b 47/06
U.S. Cl. 73—152 12 Claims

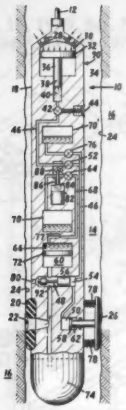


A number of pressure readings with respect to fluids in formations traversed by a well bore are obtained in a single traverse of the well bore by a special tool. The tool has a sample chamber comprising one or more compartments for receiving separate samples of formation fluid. The pressure of the fluid in each sample (and hence the pressure of the corresponding fluid in the formation) is measured. In the one-compartment embodiment, fluid is expelled from the compartment after each collection and pressure measurement of a fluid sample. In the two-compartment embodiment, fluid is collected in one compartment and a pressure measurement is made, and fluid previously collected and measured for pressure is expelled. In one embodiment, the samples are expelled into the well bore; in another, into a dump chamber carried in the tool. In embodiments in which the chamber is divided into a large number of compartments, each compartment is used for the collection of only one sample, and the collected samples are not expelled until the tool is recovered.

3,577,782
WELL LOGGING TOOL FOR MAKING MULTIPLE PRESSURE TESTS AND FOR BOTTOM HOLE SAMPLING
John Aitken, Paris, France, assignor to Schlumberger Technology Corporation, Houston, Tex.
Filed Jan. 10, 1969, Ser. No. 790,322
Int. Cl. E21b 49/00
U.S. Cl. 73—155 13 Claims

Apparatus is provided for obtaining a plurality of readings with respect to fluids in formations traversed by a well bore. The apparatus includes a housing, annular sealing means for sealing off an area of the wall of the well bore from fluid within the well bore, and formation-fluid-receiving sample chamber means within the housing in communication with sealed-off area of the wall. Gauge means operatively associated with the chamber means is provided for obtaining a reading with respect to fluid within the chamber means, and motive means is provided for bringing the chamber means into cooperation with discrete samples of formation fluid col-

lected at spaced-apart locations in the well bore. In this way, a plurality of readings with respect to fluid in the formations



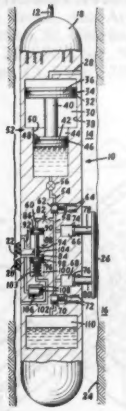
is obtainable in a single traverse of the well bore by the apparatus.

3,577,783

TOOL TO TAKE MULTIPLE FLUID MEASUREMENTS

Frank R. Whitten, and Roger Q. Fields, Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Jan. 10, 1969, Ser. No. 790,199
Int. Cl. E21b *47/06*
U.S. Cl. 73—152 **10 Claims**



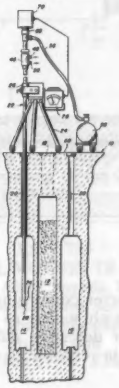
A plurality of readings with respect to fluids in formations traversed by a well bore is obtained in a single traverse of the well bore by a special tool. The tool includes a piston-cylinder assembly having two pistons of differential diameter and serving as a pressure multiplier responsive to the pressure of fluid in the well bore for generating pressure in an operating fluid in a branching conduit in the tool greater than the pressure of the fluid in the well bore at the depth of the tool. Upon opening of a valve in the conduit, the operating fluid sets a shoe against the wall of the well bore and, by reaction, forces annular sealing means on the tool against the wall of the well bore to seal off an area of the wall from fluid in the well bore. After a short delay to permit the setting and sealing, a collection chamber in the tool in communication with the annular sealing means is expanded to reduce the pressure therein and facilitate collection of a fluid sample from the formation. The delay is facilitated by a choke formed in one branch of the conduit and, in one embodiment, by a check valve and a piston-cylinder assembly mounted in the same branch.

3,577,784

METHOD AND APPARATUS FOR MEASURING COKE OVEN FLUE WALL TEMPERATURES

Joseph E. Kovacic, Pittsburgh, Pa., assignor to Koppers Company, Inc.

Filed Dec. 30, 1968, Ser. No. 787,879
Int. Cl. G01j *5/08*
U.S. Cl. 73—355R **10 Claims**



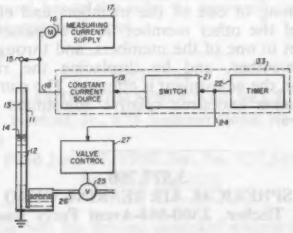
A hollow probe having an angularly positioned reflective surface is inserted through an inspection opening in a coke oven battery roof into an "off" flue. The reflective surface is focused on the flue wall at a preselected elevation and reflects the radiant energy emitted by the flue wall along an unobstructed vertical passageway within the probe to a radiation pyrometer positioned externally of the flue where the flue wall temperature is determined and recorded. The probe includes three concentric cylindrical members. Adjacent the lower end portion of the probe there is an opening in the cylindrical members providing a window for the reflective surface. A coolant is circulated between the outer and intermediate cylindrical members and an inert gas is blown through the central passageway to prevent contamination of the reflective surface.

3,577,785

TRANSDUCER CLEANING DEVICE

Lawrence Norayr Guevrekian, Kendall Park, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed June 11, 1969, Ser. No. 832,351
Int. Cl. G01l *9/00*, **G01l** *7/18*
U.S. Cl. 73—398 **5 Claims**



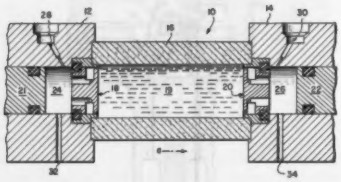
A measuring instrument comprising, in a tube, a column of an electrically conductive liquid having a height which is

responsive to the input parameter to be measured, an electrical circuit to transform the height of the liquid column into an electrical output value by measuring the voltage drop across the nonimmersed part of a current-carrying wire extending through the tube, and maintaining exact longterm performance of the wire by providing an application of heat thereto thereby preventing contamination of the wire which would otherwise cause nonlinearities between input and output values.

3,577,786
FLUERIC ACCELEROMETER

Albertus E. Schmidlin, Caldwell, N.J., assignor to General Precision Systems, Inc., Little Falls, N.J.

Filed June 25, 1968, Ser. No. 739,882
Int. Cl. G01p *15/02*
U.S. Cl. 73—515 **17 Claims**

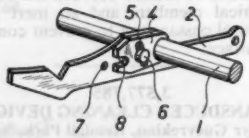


A flueric accelerometer comprising a chamber for a nonwetting liquid along with means to pass a pressurized gas through the liquid for detecting differences in hydrostatic pressure of the liquid in response to changes in acceleration of the chamber.

3,577,787
ADJUSTABLE FRICTIONAL CONNECTION

Burkhard Schmidt, and Reinhold Nibbrig, Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

Filed Nov. 20, 1969, Ser. No. 878,371
Claims priority, application Germany, Nov. 26, 1968, P 18 10 969.8
Int. Cl. G05g *1/04*
U.S. Cl. 74—522 **15 Claims**



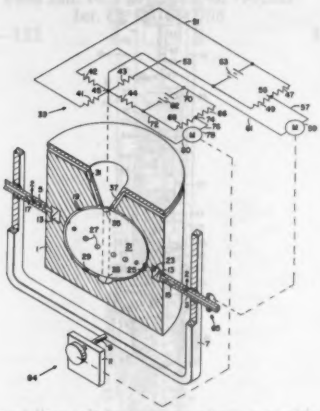
Two members having abutting surface portions are pressed into frictional engagement by rivet means so the relative position of the members can be adjusted by overcoming the friction. The adjustment is effected by a tool inserted into a bearing opening of one of the members and effecting displacement of the other member. A rivet passes through a camming slot in one of the members, and through a bore in the other member, and by displacing the rivet in the camming slot, the adjustment is effected. The camming slot is slanted prevents undesired relative adjustment of the two members.

3,577,788
SPHERICAL AIR BEARING GYRO

Friedrich J. Tischer, 2300-M4-Avent Ferry Road, Raleigh, N.C.

Filed Jan. 16, 1969, Ser. No. 791,599
Int. Cl. G01c *19/12*, **G01c** *19/28*
U.S. Cl. 74—5.6 **10 Claims**

A spherical air bearing gyro that is pneumatically actuated and supported as a two-degree-of-freedom gyro. One specie of the invention has a bolometer circuit that is mounted relative to the gyro housing and responds to air blown thereover from an exhaust of the pneumatically actuated gyro. The

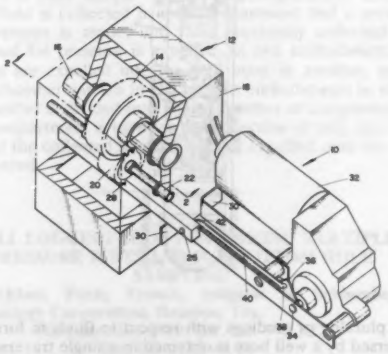


bolometer circuit senses deviations of the gyro rotor and adjusts the gyro housing relative to the gyro rotor to correct deviations.

3,577,789
POWER TAKEOFF ACTUATOR

Claude Sansam, P.O. Box 235, North Land O'Lakes, Wis.

Filed Mar. 19, 1969, Ser. No. 808,549
Int. Cl. F16h *37/100*, **F16h** *21/44*, **F16h** *5/06*
U.S. Cl. 74—11 **9 Claims**



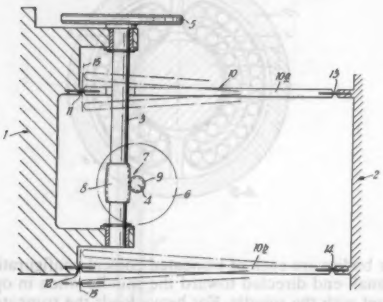
The apparatus includes a rotary reversible electric motor which is energized by the electrical system of a vehicle. The motor has an oscillatable output shaft which carries a radially extending link having an opening in its outer end. A translatable link transmits power between the shaft and a shiftable lever of the power takeoff unit which accomplishes engagement and disengagement of the takeoff unit. The translatable link either rigid or flexible has oppositely offset end portions which engage openings in the radially extending link and shift lever to effect a connection therebetween.

3,577,790

MECHANISMS FOR EFFECTING FINE AND COARSE ADJUSTMENT

Alexander John Munro, Acomb, and John Francis Taplin, Croydon, England, assignors to Vickers Limited, London, England

Filed Oct. 10, 1969, Ser. No. 865,307
Int. Cl. F16h 29/20
U.S. Cl. 74—89.14 4 Claims



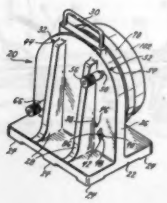
A mechanism for effecting fine and coarse adjustment in which a first member is mounted for movement relatively to a second member. The mechanism includes two substantially mutually perpendicular shafts which are geared together and which are rotatable relatively to each other to effect said movement.

3,577,791

CONTROL SYSTEM

Jan Abraham Vanden Broek, Ann Arbor, Mich., assignor to Conduction Corporation, St. Charles, Mo.

Filed Jan. 22, 1969, Ser. No. 792,949
Int. Cl. F16h 27/02
U.S. Cl. 74—89.15 7 Claims



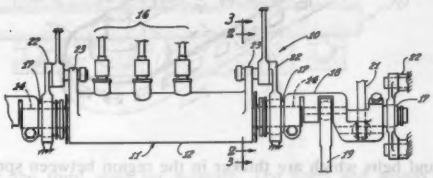
A mount for a optical element has a stationary base, a mounting plate, and four interacting surfaces carried by that base and mounting plate. One of those interacting surfaces provides an essentially fixed spacing between predetermined areas on the base and mounting plate, a second of those interacting surfaces coacts with said one of those interacting surfaces to permit adjustment of the mounting plate relative to the base about one axis, a third of those interacting surfaces coacts with said one of those interacting surfaces to permit adjustment of the mounting plate relative to the base about a second axis, and the fourth of those interacting surfaces coacts with said one of those interacting surfaces to prevent rotation of the mounting plate in its own plane relative to the base.

3,577,792

ROTARY ACTUATOR AND METHOD OF MOUNTING SAME

Earl E. Parks, Los Angeles, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed Nov. 10, 1969, Ser. No. 875,420
Int. Cl. F16h 21/44
U.S. Cl. 74—96 3 Claims



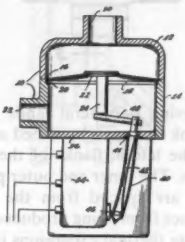
A rotary actuator and means for installing the same, the latter functioning to arrest axial loads prior to being transmitted to and resisted by the actuator proper and including means permitting the housing of the actuator to "float" or operate in a plurality of positions.

3,577,793

MECHANICAL MOTION TRANSMITTER

Allen V. C. Davis, 5600 Alta Canyada, La Canada, Calif.

Continuation-in-part of application Ser. No. 717,522, Apr. 1, 1968, now abandoned. This application June 30, 1969, Ser. No. 868,660
Int. Cl. F16h 21/44; F16j 15/50
U.S. Cl. 74—100 7 Claims



There is disclosed a switch unit having a metal plate forming one wall of a fluid chamber, such plate supporting an electrical switch exteriorly of the chamber. A thin-walled tube is welded at one end in an opening in the metal plate, with the outer end of the tube positioned to actuate the switch plunger. Extending through the tube is a rod having a modulus of elasticity that is greater than that of the tube. A transverse arm on the end of the rod in the chamber is movable by a pressure-responsive element to subject the outer end of the rod, and hence the tube, to transverse operation for actuating the switch plunger.

3,577,794

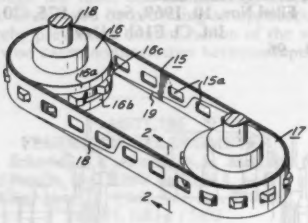
LAMINATED SPROCKET BELT

Franklin W. Kerfoot, Jr., 678 Andover Road, Newton Square, Pa. 19073

Filed June 17, 1968, Ser. No. 737,541
Int. Cl. F16g 1/26
U.S. Cl. 74—232 7 Claims

An endless belt for driving sprocket wheels is made of a plurality of layers, each layer having a butt joint which is spaced longitudinally of the belt from the joint of other layers. In one form the length of the joint is at least twice the

width of the belt. The joints pass between adjacent ones of the sprocket holes. Other forms include reinforcing bands



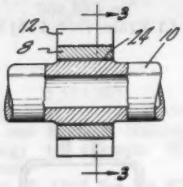
and belts which are thicker in the region between sprocket holes.

3,577,795

MEANS TO OVERCOME DIFFERENTIAL THERMAL EXPANSION EFFECTS IN BIMETALLIC SPLINED SHAFT ASSEMBLIES

John A. Bennett, Peterborough, England, assignor to Chandler Evans, Inc., West Hartford, Conn.

Filed Oct. 27, 1969, Ser. No. 869,742
Int. Cl. F16h *55/06;* **B21b** *53/28;* **F16d** *1/06*
U.S. Cl. 74—446 **4 Claims**



A steel shaft having peripheral lands is broached by a splined carbide blank to form a broached assembly having interfaces between the lateral flanks of the lands and lateral flanks of the splines. The inner and outer peripheral portions of the steel shaft are spaced from the carbide blank to prevent radial stresses from being produced during broaching and to accommodate thermal expansions in the broached assembly. Circumferential chip grooves are provided in that portion of the shaft which is to be broached by the carbide blank to prevent continuous chips from forming during the broaching process which could seize on the cutting face of the carbide blank. The carbide blank of the broached assembly resists displacements relative to the steel shaft. The interfaces may be angularly disposed to alleviate large circumferential thermal stresses.

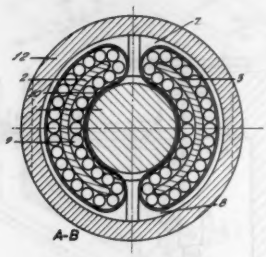
3,577,796

SPINDLE GUIDE

Werner Eissfeldt, Wiesbaden-Rambach, Germany, assignor to Nirona-Werke, Nier & Ehmer KG, Bleidensladt, Germany

Filed Aug. 11, 1969, Ser. No. 848,853
Claims priority, application Germany, Aug. 13, 1968, July 16, 1969, P 17 52 958.7, P 19 36 170.7
Int. Cl. F16h *1/18, 55/22*
U.S. Cl. 74—59 **12 Claims**

An antifriction nut and threaded spindle assembly uses a plurality of continuously recirculating roller bodies traveling through a plurality of individually continuous ways. The ways are positioned sequentially along the axis of the spindle. The ways are each formed by a groove in the nut body and a retainer strip surrounding the groove. That portion of the strip adjacent the spindle fits between the lands of the spindle threads. The nut is split and a clamping ring, whole or split, circumscribes the nut for compressing the nut about the spindle for control of play between the nut and spindle. In one embodiment the nut is formed in two halves having a plurality of the individually continuous ways in each half. The halves (as seen in cross section) may have an inner curvature formed about the axis of the spindle and outer curvature formed about axes spaced from the spindle axis in the direction of the respective nut half. In some embodiments the



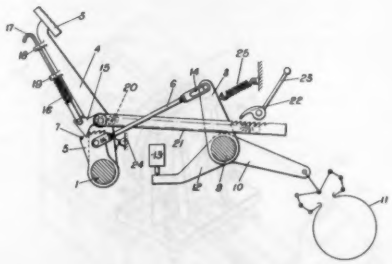
roller bodies are each of truncated conical configuration with the small end directed toward the spindle when in operative contact with the spindle. For heavy loads the truncated conical roller bodies meet the lands of the spindle threads in a line contact such that the lines extended, along with the conical axis, meet at a point on the spindle axis. The large end of the truncated conical bodies is concave and in the return portion of the way contact a crown on the portion of the nut defining the return portion of the way.

3,577,797

BRAKING SYSTEM FOR A VEHICLE

Eugenio Todeschini, Reggio Emilia, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed June 5, 1969, Ser. No. 830,737
Claims priority, application Italy, June 10, 1968, 17559A/68
Int. Cl. G05g *11/00*
U.S. Cl. 74—479 **1 Claim**



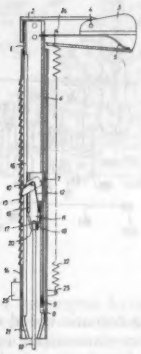
A braking system for a vehicle includes primary powered and secondary mechanical brake actuation means for alternative operation of a brake. The secondary mechanical brake actuation means includes connection means adapted to be adjusted automatically in response to repeated operation of the primary powered brake actuation means. In a preferred embodiment the connection means includes a ratchet and a cooperating pawl for stepwise adjustment of the connection means and a lost motion connection to accommodate free movement within the connection means during operation of the primary powered brake actuation means. When a predetermined amount of brake wear has taken place operation of the primary powered brake actuation means is effective to cause movement between the pawl and the ratchet and adjust the connection means.

3,577,798

HAND BRAKE CONTROL MECHANISMS

Michel Guettier, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, Hauts de Seine, France and Automobiles Peugeot, Paris, France

Filed Apr. 17, 1969, Ser. No. 817,111
Claims priority, application France, Apr. 22, 1968, 148934
Int. Cl. G05g *1/00*
U.S. Cl. 74—503 5 Claims



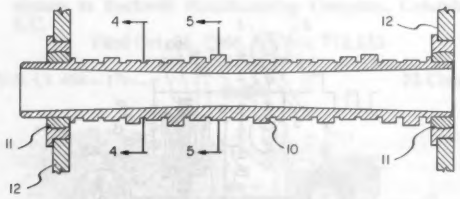
A handbrake control mechanism having a control member slidably mounted in a slideway guide and connected to the brake control cable. The control member has a tubular body with a handgrip and countergrip at one end, several longitudinal slits, a retaining member constituted by a spring biased pawl pivoted on a pivot pin carried by a shuttle inside the tubular body and operatively connected to the countergrip by a rod. The slideway-guide is cylindrical and has a rack formed along one side to coact with the pawl when the brake is set. A brake cable is connected to the shuttle.

3,577,799

CAMSHAFT

Warren L. Harvey, New Providence, N.J. (P.O. Box 622 West Main St., Mendham, N.J., 07945)

Filed July 1, 1969, Ser. No. 838,097
Int. Cl. F16h *53/02*
U.S. Cl. 74—567 1 Claim



A camshaft as used to actuate a plurality of spring returned followers. The camshaft resists the bending loads imposed on it by utilizing a rigid tubular construction in which the inside diameter tapers to a minimum near the center of the length of the camshaft resulting in greater material strength at a section furthest from the bearing support at either end.

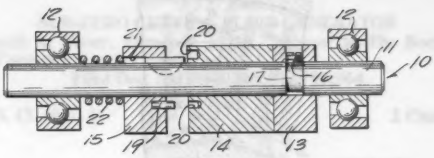
3,577,800

ADJUSTABLE ECCENTRIC

Edwin L. Jones, Brookfield, Wis., assignor to Douglas Dynamics Corporation, Milwaukee, Wis.

Filed Mar. 3, 1969, Ser. No. 803,700
Int. Cl. G05g *1/24*
U.S. Cl. 74—571 7 Claims

An eccentric is mounted on a rotatable shaft and includes three axially spaced masses one of which is fixed, another is circumferentially fixed and axially slidable, and a third is adjustable circumferentially. The axially slidable mass holds the third mass in a selected position and is slidable axially to release the third mass for rotation. The fixed and axially slidable masses have equal and common eccentricities relative to the shaft and the combined masses thereof equals that of the third mass.

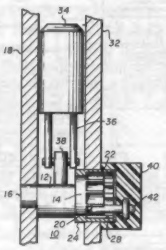


3,577,801

LOCKING DEVICE FOR AN ECCENTRIC MEMBER

Louis A. Netta, North Brunswick, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Aug. 25, 1969, Ser. No. 852,642
Int. Cl. G05g *3/00*
U.S. Cl. 74—571 5 Claims



The eccentric locking device comprises an extension on the eccentric itself, a bushing placed about the aperture into which the eccentric is positioned and means for conjointly engaging the bushing and the extension of the eccentric to prevent relative movement therebetween. In a first embodiment a plurality of cavities is placed about the outer surface of the extension and the inner surface of the bushing. A pin is inserted conjointly in the cavities of both in order to prevent relative movement therebetween. In a further embodiment, the extension terminates in a transverse tab; a cap having a slot therein is then inserted atop the bushing's outer surface and the tab is made to engage the slot to thereby prevent relative motion between the bushing and the eccentric.

3,577,802

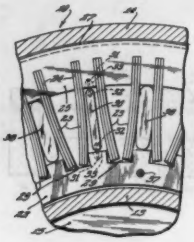
LEAF SPRING TUNED VISCOUS VIBRATION DAMPER

Rollin Douglas Rumsey, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Mar. 7, 1969, Ser. No. 805,271
Int. Cl. F16f *15/16*
U.S. Cl. 74—574 16 Claims

Resilient generally axially extending spokes are anchored at radially outer ends thereof to the radially outer wall within a circular working chamber of a housing, with the radially inner ends of the spokes connected to an inertia mass flywheel for energy absorption, tuned damping of relative oscillatory vibratory motions between the flywheel and the

housing. Relative vibratory oscillations are also resisted by a viscous damping medium coupling between confronting



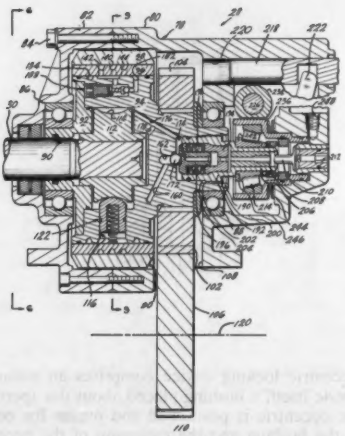
shear film spaced parallel surfaces of the housing and the inertia mass.

3,577,803

VARIABLE TORQUE TRANSMISSION

Otto Mueller, 13 Byfield Lane, Dearborn, Mich.

Filed May 12, 1969, Ser. No. 823,872
Int. Cl. F16h *37/06*
U.S. Cl. 74—665 **9 Claims**



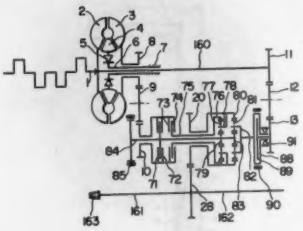
Apparatus for a four or six wheel drive motor vehicle which includes a variable ratio torque transmission assembly connected by drive shafts to front and rear axles. The variable ratio torque transmission assembly has a rotary input member which receives torque from the engine, and first and second rotary output members connected to the front and rear axles respectively. The output members are coupled together by a hydraulic torque transmitting mechanism which includes means for selectively setting the ratio of the input torque that is transmitted to the two output members and thereby to the front and rear axles. This arrangement permits any desired ratio of torque transmission, such as one-third of the torque being transmitted to the front axle and two-thirds of the torque being transmitted to the rear axle. The assembly also includes a remote control means whereby the driver of the vehicle can lock the mechanism between the two output members so that full or maximum torque is transmitted to the front axle.

3,577,804

TORQUE SPLIT TYPE AUTOMATIC SPEED CHANGE DEVICE

Kazuhiko Ohno, and Yoichi Mori, Yohohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama City, Japan

Division of Ser. No. 640,219, May 22, 1967, Pat. No. 3,455,185. Filed Mar. 13, 1969, Ser. No. 822,345
Claims priority, application Japan, June 30, 1966, 41/42125
Int. Cl. F16h *47/08*, **F16h** *37/08*
U.S. Cl. 74—688 **10 Claims**



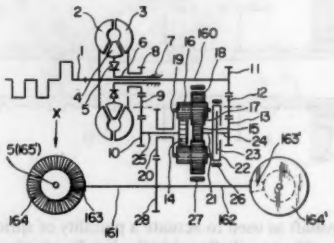
A torque split type automatic speed change device comprising a hydraulic power transmission means having a pump connected to one end of an engine crankshaft and a turbine, a planetary gear assembly disposed in parallel with the axis of the hydraulic power transmission means, a first power transmission route extending between said pump and said planetary gear assembly through suitable transmitting means, and a second power transmission route extending between said turbine and said planetary gear assembly through another transmitting means, thereby powers transmitted to said planetary gear assembly through said two routes are synthesized.

3,577,805

TORQUE SPLIT TYPE AUTOMATIC SPEED CHANGE DEVICE

Kazuhiko Ohno, and Yoichi Mori, Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama City, Japan

Division of Ser. No. 640,219, May 22, 1967, Pat. No. 3,455,185. Filed Mar. 13, 1969, Ser. No. 822,346
Claims priority, application Japan, June 30, 1966, 41/42125
Int. Cl. F16h *47/08*, **F16h** *37/08*
U.S. Cl. 74—688 **5 Claims**

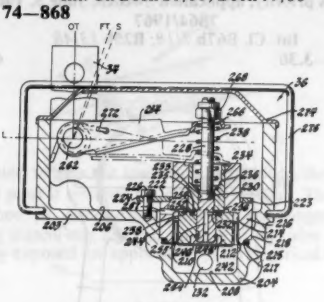


A torque split type automatic speed change device comprising a hydraulic power transmission means having a pump connected to one end of an engine crankshaft and a turbine, a planetary gear assembly disposed in parallel with the axis of the hydraulic power transmission means, a first power transmission route extending between said pump and said planetary gear assembly through suitable transmitting means, and a second power transmission route extending between said turbine and said planetary gear assembly through another transmitting means, thereby powers transmitted to said planetary gear assembly through said two routes are synthesized.

3,577,806
HYDRAULIC MODULATOR VALVE CONTROL

Robert H. Schaefer, Westfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1969, Ser. No. 852,709
Int. Cl. B60k *21/00*, B60k *19/00*
U.S. Cl. 74—868 11 Claims

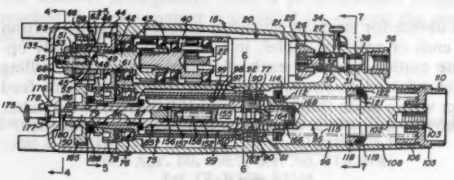


A transmission for an engine having a fuel feed control member movable from zero to full throttle position and an automatic shift control system operative in response to an output governor pressure signal and a torque demand pressure signal for shifting the transmission between low and high speed drives. A force transmitting system for transmitting a force proportional to torque demand position having a pair of expansible chambers interconnected by a fluid passage filled with fluid and each chamber having a movable wall. A spring positioned between said movable torque demand member and one movable wall generates a force proportional to torque demand position on the one movable wall so the system pressure is proportional to torque demand and the system transmits to the other movable wall a force proportional to the position of the torque demand member without significant fluid movement in the system. The other movable wall actuates a regulator valve to provide a torque demand pressure proportional to the position of said torque demand member which functions with a governor pressure to control the automatic shift valves.

3,577,807
PORTABLE POWER TOOL

Robert H. Alexander; Ronald C. Falter; Cecil D. Ringer, Columbia, S.C., and Eugene Linsker, Dayton, Ohio, assignors to Rockwell Manufacturing Company, Columbia, S.C.

Filed Oct. 31, 1968, Ser. No. 772,132
Int. Cl. B23b *45/14*
U.S. Cl. 408—17 22 Claims

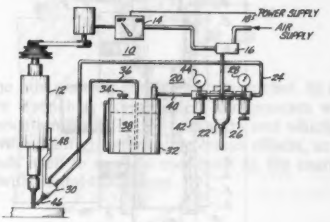


A portable tool incorporates an air motor which drives a tubular drive shaft splined to a spindle movable axially in a direction parallel to the axis of the motor. The spindle has a hollow rearward end portion with internal threads which receive screw members mounted on a tubular feed shaft also driven by the motor through an adjustable detent clutch. An adjustable stop collar surrounds the spindle and provides precise depth control, an air cylinder provides rapid advancement of the spindle, and the clutch provides automatic disengagement of the positive feed as well as limited rotation of the spindle at the forward end of the feed stroke before the spindle retracts. The controls for adjusting the stop collar and for effecting positive feed and rapid advancement and retraction of the spindle are located at the rear of the tool.

3,577,808
SUB-ZERO CUTTING FLUID GENERATOR

Gerrit A. Visser, Edmonds, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 13, 1968, Ser. No. 785,964
Int. Cl. B23b *47/00*
U.S. Cl. 408—61 2 Claims

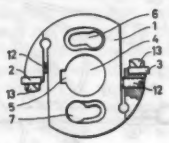


This cutting fluid generator comprises a variety of components connected and arranged so that an improved method for applying cutting fluids (consisting of a coolant-lubricant mixture) through an external mist delivery to drills is obtained. Pressurized, dry, clean air is delivered to a mixing station provided with a venturi which increases the speed of the air via a suction chamber connected to the cutting fluid supply. The cutting fluid is micronized and intermixed into the airstream by vacuum suction of the passing air and the micronized cutting fluid will instantaneously evaporate in the mist projected onto the drill and workpiece, which will result in thorough lubrication and a −26° F. cooling.

3,577,809
QUICKSET TOOLHOLDER

Walter Brandl, Bad Homburg vor der Hohe, and Rudolf Mathes, Niedereschbach, Germany, assignors to Reimers Getriebe A. G., Zug, Switzerland

Filed Aug. 22, 1968, Ser. No. 754,612
Claims priority, application Germany, Aug. 30, 1967, P 16 02 941.7
Int. Cl. B23b *29/034*
U.S. Cl. 77—58 2 Claims



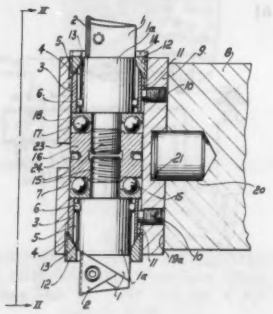
A toolholder for holding cutting tools is provided with a standard cone at its rear end for insertion into a machine tool. The front end consists of an axially projecting stud. Disc-shaped tool carriers are provided with a central bore and further with means for receiving and holding at least one cutting tool. By means of their bore, the tool carriers are arranged on the stud to which they are positively secured by clamping means, for example, by a bayonet coupling. The distance between the nose of the cutting tools and the rear surface of the tool carriers is at all carriers set to a uniform predetermined range, thereby avoiding any shifting of the zero-point when one tool carrier is exchanged for another one.

3,577,810

BORING BAR INSERT

Otto Eckle, Lochgau, Germany, assignor to Firma Komet Stahlhalter-Und Werkzeugfabrik, Robert Breuning-G.m.b.H., Neckar, Germany

Filed Mar. 12, 1969, Ser. No. 806,572
Claims priority, application Germany, Mar. 20, 1968, P 17 52 014.8, P 17 52 012.6
Int. Cl. B23b *29/034*
U.S. Cl. 77—58 8 Claims



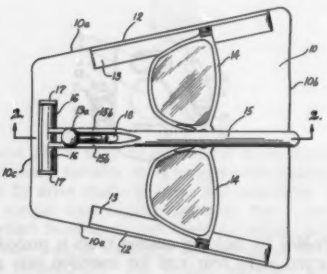
A boring bar insert having two counterwise movable boring tool carriers, the tools of which are arranged at oppositely actuated ends of the boring tool carriers when rotated through 180° to one another. For counterwise movement and adjustment of the boring tool carriers there is between their mutually facing shank ends an adjusting ring cooperating with two counterwise screwthreads of the boring tool carriers and a centering device. The boring tool holders are securely held and also can be moved counterwise in the clamped condition. Centering of the boring tool carriers with respect to the boring bar axis is possible.

3,577,811

DEVICE FOR RETENSIONING EYEGLASS FRAMES

Ambrose D. Walker, Clinton, Mo., assignor to Leo X. O'Brien, Independence, Mo., fractional part interest

Filed Dec. 12, 1968, Ser. No. 783,338
Int. Cl. B25b *11/00*
U.S. Cl. 81—3.5 8 Claims



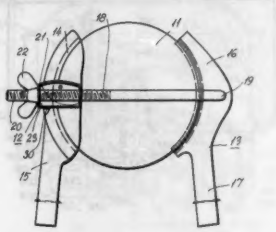
This invention has to do with a retensioning device for eyeglass frames and is adaptive for use on different sized frames. The retensioner employs a pressure lever pivoted centrally upon its base remote from the nosepiece of the glasses to permit the free end of the pressure lever to nest in the nosepiece curvature, and a tensioning assembly for manually imposing and maintaining for desired intervals an adjusted downward pressure on the nosepiece and frame.

3,577,812

OPENING DEVICE FOR CANS AND SIMILAR CONTAINERS PROVIDED WITH TWIST LIDS

Ivar Alvar Asp, Storbergsliden 15, Sollentuna, Sweden

Filed May 31, 1968, Ser. No. 733,478
Claims priority, application Sweden, June 5, 1967, 7864/1967
Int. Cl. B67b *7/18;* B25b *13/48*
U.S. Cl. 81—3.36 4 Claims



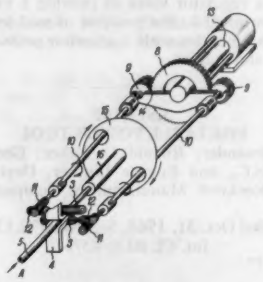
An opener in the form of a pair of tongs for cans, jars and similar containers provided with twist lids, which includes two leg members presenting handle portions and jaw portions, wherein one jaw portion is adapted to be applied to the surface of the container, while the other is brought to bear against the lid, and wherein the leg members are so connected that slight pressure on the handle members causes the lid to rotate relative to the body of the container.

3,577,813

DEVICE FOR STRIPPING OUT SHIELDING SHEATH

Evgeny Nikolavevich Vorontsov, Blagodatnaya ulitsa, 25, kv. 45, Leningrad, U.S.S.R.

Filed Apr. 9, 1969, Ser. No. 814,573
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.51 1 Claim



A device for stripping shielding sheath or insulation from the ends of wires or cables, in which two diametrically opposite cutting members each of which constitutes a milling cutter adapted to rotate in the direction of the wire feed coact with a blade fixed in position with respect to the cutter to provide shears to sever the shielding sheath or insulation.

3,577,814

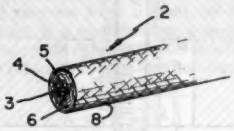
APPARATUS FOR EXPOSING CORE OF AN INSULATED WIRE

James Woodrow Hammond, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 28, 1969, Ser. No. 853,816
Int. Cl. H02q *1/12*
U.S. Cl. 81—9.51 7 Claims

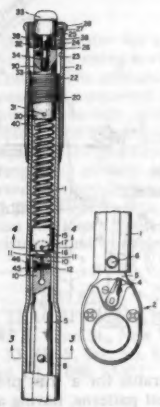
Apparatus for exposing the conducting core of an insulated wire comprises a pair of jaws movable relatively towards and away from each other between open and closed positions. Clamping means are provided on the corresponding ends of

the jaws to clamp a wire extending between the jaws when the jaws are closed. The portion of the wire which extends between the jaws is loosely confined against substantial lateral flexure. Insulation pushing fingers mounted in the jaws



are adapted to grip the insulation adjacent to the end of the wire and push it towards the clamping means. The insulation is bunched or compressed between the fingers and the clamping means and the end portion of the wire core which is thereby exposed for application of an electrical terminal.

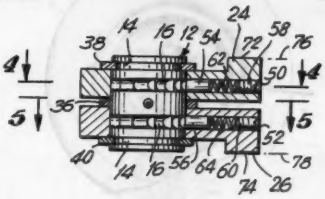
3,577,815
TWO-WAY TORQUE WRENCH
Clifford A. Bergquist, Alhambra, Calif., assignor to Pendleton Tool Industries, Inc., Los Angeles, Calif.
Filed Apr. 2, 1969, Ser. No. 812,605
Int. Cl. B25b *13/46*
U.S. Cl. 81—52.4 **11 Claims**



A predetermined torque release wrench which may be used to apply a torque to a fastener in either rotary direction. The wrench includes an arm connected to the ratchet head of the wrench and a spring pressed cam and follower arrangement. The arm overcomes the resistance of the cam and follower arrangement when a predetermined torque is reached. An arrangement is provided for varying the profile of the cam to permit calibration of the wrench.

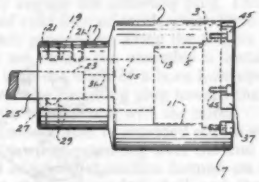
3,577,816
RATCHET WRENCH
Jerry Alexander, 64 Hedgerow Lane, Jericho, N.Y., and Irving J. Stevens, 130 Margaret Blvd., Merrick, N.Y.
Filed Apr. 10, 1969, Ser. No. 815,074
Int. Cl. B25b *13/46*
U.S. Cl. 81—63.1 **10 Claims**

A ratchet type wrench wherein a pair of swingable handles swing around a ratchet and have a pair of pawls which respectively coact with the ratchet to turn the latter in one direction with respect to one handle when the other handle is turned in a given direction and prevents backlash while providing positive ratcheting both forward and reverse without friction applied to the wrench. The wrench is of a relatively small size and is extremely thin so that it is capable of being used where only a small operating space is afforded. A very small radius of arc is required to effect a ratchet movement. The pair of handles are relatively thin and are maintained close to each other with these handles respectively having outer exterior side surfaces directed away from each other and respectively located substantially in planes normal to the axis of the rotary ratchet. The distance between these planes is actually the maximum thickness of the entire wrench. One handle is used for stabilizing the



wrench, and the other is used for driving the ratchet. In addition, the entire wrench is composed of components which require no lubrication for effective operation and which can be sterilized without suffering any deleterious effects, so that the wrench lends itself to medical uses such as, for example, in connection with dental operations.

3,577,817
SOCKET WRENCH
Kave A. Smith, Jennings, and Henry L. Ladendecker, St. Louis, Mo., assignors to McNeil Corporation, Akron, Ohio
Filed Aug. 25, 1969, Ser. No. 852,712
Int. Cl. B25b *13/06*, B25b *13/00*
U.S. Cl. 81—121 **9 Claims**

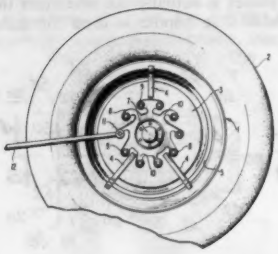


A socket wrench is formed as a barrel having an end in which is a circular opening. The opening is of an internal diameter approximately equal to the distance across the corners of a hexagonal nut. Said end is grooved crosswise at 120° intervals. In each groove is removably fastened a bar made of wear-resistant tool-steel bar stock of square cross section chamfered on one corner. The inner flat faces of these bars bridge across said opening for flatwise engagement with every other flat face of the hexagonal nut. The segments of said circular opening between bars extend clear of the sides of the nut which are not engaged by the bars. Under the opening and the bridging bars the barrel has an internal shoulder which is engageable with the corners of the nut to determine the axial positions of the bars on the nut. The other end of the barrel is provided with an adapter for coupling to a rotary power driving element.

3,577,818
LUG WRENCH SUPPORT
Leslie Dick Cramer, 888 Amoretti St., and John R. Moore, 558 Lincoln St., P.O. Box 765, Lander, Wyo.
Filed Sept. 25, 1969, Ser. No. 861,070
Int. Cl. B25b *13/58*
U.S. Cl. 81—180 **8 Claims**

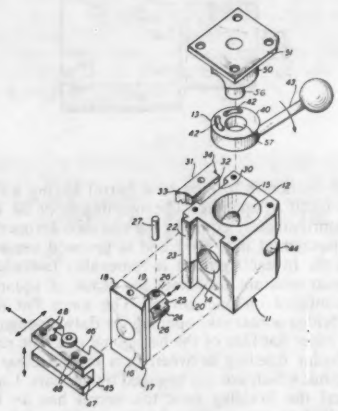
A wheel nut wrench support for use in the removal of wheels from a vehicle, particularly in connection with trucks and similarly heavy-duty vehicles, including a plate member provided with a plurality of slotted apertures distributed in an annular pattern thereon and provided additionally with multiple elements extending radially from the plate member and adapted to engage a wheel rim to support the plate member in spaced relationship with the wheel in an orientation substantially parallel to the plane of the wheel wherein the plu-

rality of apertures are aligned axially with the plurality of wheel lugs. According to a modification of the present inven-



tion, at least one of the support elements is adjustable in length, thereby rendering the plate member useful in conjunction with wheels of different radial dimensions.

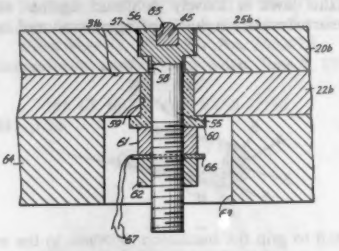
3,577,819
TOOLPOST
Hans Scheideler, 7100 Boulevard East, Guttenberg, N.J.
Filed Sept. 5, 1969, Ser. No. 855,616
Int. Cl. B23b *29/26*
U.S. Cl. 82—37 **6 Claims**



A toolpost wherein a clamp for a toolholder is moved into gripping relation with the toolholder by a rotatable disc with an arcuate cam slot, that moves the clamp; the slot disposed eccentrically with the axis of rotation of the cam.

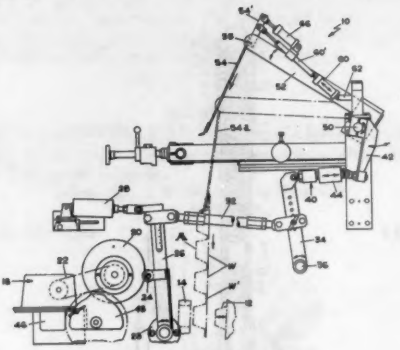
3,577,820
DIE FOR SEALING OR CUTTING THERMOPLASTIC MATERIAL
Paul Silverstein, Jamaica, N.Y., assignor to Applied Synthetics Corp., East St. Louis, Ill.
Filed Oct. 25, 1968, Ser. No. 770,654
Int. Cl. B26d *7/10*
U.S. Cl. 83—171 **5 Claims**

A pair of die plates of insulating material, clamped in facing engagement, are routed to form grooves, the groove of



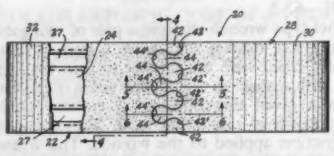
one plate being greater in width than the groove of the other plate. Heated die means are then mounted in the grooves.

3,577,821
TRIM PRESS ASSEMBLY
Roger L. Medendorp, Grand Rapids, Mich., assignor to Kirkhof Manufacturing Corporation, Grand Rapids, Mich.
Filed Jan. 21, 1969, Ser. No. 792,618
Int. Cl. B65h *17/18*
U.S. Cl. 83—238 **4 Claims**



Advancing apparatus for a trim press of articles formed into a web in repeat patterns, having a reciprocating pusher that has a regular stroke length, and periodically has a greater stroke length by reason of actuation of a special fluid cylinder that in one form of the invention forms a component of the connecting linkage from the power drive to the pusher, and in a second form of the invention, is attached to an extensible portion on the pusher.

3,577,822
REMOVABLE FREEWHEELING RESILIENT COVER FOR ROTARY ANVIL
Louis E. Sauer, and Robert W. Sauer, St. Louis, Mo., assignors to Centenary Central, Inc., St. Louis, Mo.
Filed Apr. 16, 1969, Ser. No. 816,657
Int. Cl. B26d *7/20*
U.S. Cl. 83—659 **13 Claims**



This is a freewheeling resilient rotary diecutting anvil cover comprising a flexible member of one or multiple pieces

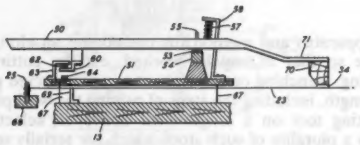
releasably secured together along a generally axial line or lines including one or more annular ribs on the inner surface for disposition in annular grooves in the cylindrical supporting base in which at least the portions of the rib or ribs leading to the releasable connection or connections are of split T-cross section and collapsible to relieve binding and to permit installation and removal from a head, or the like, without removing the head. In a modification, a cover lengthened by use can be cut to smaller size. Another modification employs a metal plate or plates to reduce lengthening.

3,577,823

ACTUATOR FOR STRINGED MUSICAL INSTRUMENT

Leonard W. Pavia, 460 Columbia Turnpike, Florham Park, N.J.

Filed Apr. 15, 1969, Ser. No. 816,198
Int. Cl. G01c *1/00;* **G10c** *1/06;* **G10d** *3/16*
U.S. Cl. 84—174 **3 Claims**



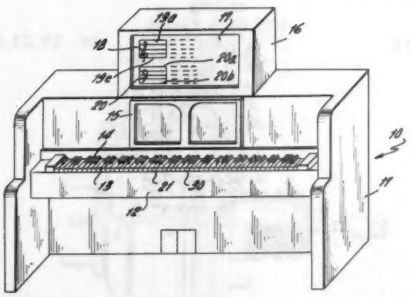
I disclose an actuator or vibrator for a keyboard stringed musical instrument wherein the string is vibrated by adhesion of the string to the actuator. The adhesive effect is obtained by mixing a glazing paste of permanent flexibility in a solvent, absorbing the mixture through a felt damping pad so that it is fully impregnated, then evaporating the solvent, and affixing the thus-impregnated felt pad onto a body portion of the actuator. The glazing paste consists of an inert material, such as talcum, dispersed in a nondrying soft wax, such as a polyamide, plasticized polyethylene wax, or a soft wax of natural origin which also contains a small amount of water to obtain the proper consistency and workability.

3,577,824

MUSIC TEACHING MACHINE

Lawrence P. Lavan, 245 E. 72nd St., New York, N.Y.

Filed May 13, 1969, Ser. No. 824,111
Int. Cl. G09b *15/02*
U.S. Cl. 84—478 **7 Claims**



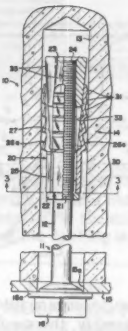
A music teaching machine produces small lighted areas on a screen having musical notations in response to depressions of the keys of an associated musical instrument. The lights are color coded and physically positioned to indicate the sets of notes constituting major thirds and minor thirds. A movie picture projector, lens system, and a mirror are arranged to project notes, to be played, on the same screen.

3,577,825

BOLT ANCHOR AND METHOD FOR MAKING SAME

Hans E. Reusser, Cleveland, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Nov. 30, 1967, Ser. No. 687,052
Int. Cl. F16b *13/06*
U.S. Cl. 85—76 **34 Claims**



An anchor assembly particularly adapted for use with a roof plate to support a mine roof. The assembly includes a bolt having a threaded end, a camming plug threaded on the bolt, and an expansion shell. The disclosed shell structure includes a polygonal, tubular collar portion and a plurality of fingers projecting longitudinally from the collar. In use, the fingers frictionally engage the camming plug. The fingers include a plurality of cold formed teeth which have an increasing depth and pitch proceeding along the fingers toward the collar and which are, when the assembly is installed, urged into engagement with the walls of a bore hole upon rotation of the bolt to move the camming plug toward the collar and cam the fingers into engagement with the bore.

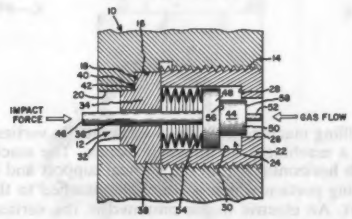
One disclosed embodiment is provided with a wirelike bail member having a portion extending over the end of the bolt and end portions engaging shoulders formed on the expansion shell so that the unexpanded shell and the plugs are maintained in assembled position for insertion into the bore. The bail member maintains the camming plug and shell assembled until the shell has been partially expanded, after which the bail member is yielded in a manner which does not impede anchoring of the assembly in the bore or tensioning of the bolt.

3,577,826

BELLOWS SEALED FIRING PIN

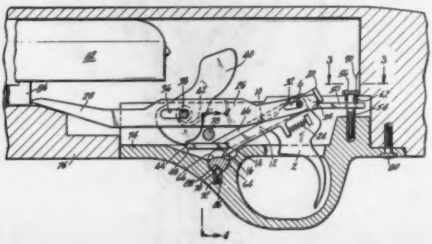
Eugene Ashley, Burlington, and Douglas Pray Tassie, St. George, Vt., assignors to General Electric Company

Filed July 22, 1969, Ser. No. 843,728
Int. Cl. F41f *11/00*
U.S. Cl. 89—26 **12 Claims**



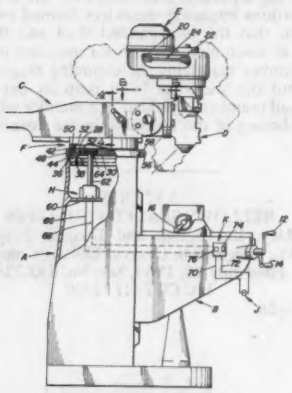
A firing pin bolt assembly includes a tubular bellows having one end sealed to and about the penetrator end and its other end sealed to the bolt about the firing pin passageway.

3,577,827
TRIGGER MECHANISM
William J. Billett, Fairmont, Minn., and Edwin S. Vartanian, North Haven, Conn., assignors to Olin Mathieson Chemical Corporation
Filed Jan. 27, 1969, Ser. No. 793,958
Int. Cl. F41c *19/00*
U.S. Cl. 89—145 **11 Claims**



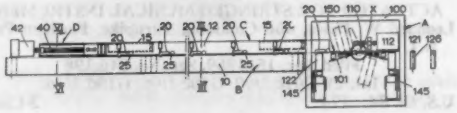
A trigger mechanism for a semiautomatic firearm having a reciprocating bolt assembly, the mechanism having a trigger member which is releasably connected to a sear member. The trigger member is disconnected from the sear by reciprocation of the bolt assembly or by actuation of a safety. Means are provided for adjusting the trigger pull and for retaining the preset trigger pull against maladjustment.

3,577,828
MILLING MACHINE
Leslie P. Stickney, Portland, Maine, assignor to Gulf & Western Precision Engineering Company, Manchester, Conn.
Filed Apr. 17, 1969, Ser. No. 817,049
Int. Cl. B23c *1/12*
U.S. Cl. 90—15 **1 Claim**



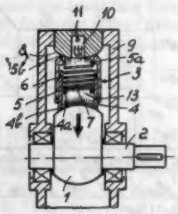
A milling machine includes a substantially vertical support having a machine head attached thereto. The machine head extends horizontally from the vertical support and includes a mounting portion which is rotatably attached to the vertical support. An electric motor mounted in the vertical support drives a ring gear on the machine head to rotate the machine head about a substantially vertical axis. The machine head includes a tool spindle. Rotational movement of the machine head moves the tool spindle in an arcuate path so that arcuate shapes may be machined. The tool spindle is preferably pivotally attached to the machine head so that sloping arcuate surfaces may be machined.

3,577,829
METHOD AND APPARATUS FOR CUTTING COMPONENTS TO LENGTH
James Hurn, Rowley, Melksham, Wiltshire; Charles Richard Forbes King, 6 Somerset Lane, and Donald Raymond Deane, Foxhall Farm, Weston, Bath, Somerset, England
Filed Sept. 6, 1968, Ser. No. 757,912
Claims priority, application Great Britain, Sept. 13, 1967, 41799/67
Int. Cl. B23c *9/00*; B26d *7/16*; B27b *5/18*
U.S. Cl. 90—21R **17 Claims**



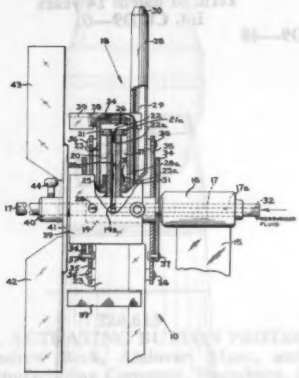
Apparatus and method for positioning an elongate workpiece so that it may be worked, e.g. by cutting, sawing, drilling, trenching or shearing, at any preselected point along its length, including the steps of passing the workpiece from a working tool on a longitudinal conveyor; selecting a stop from a plurality of such stops which are serially spaced from said working tool over at least part of the length of the conveyor; adjusting the longitudinal position relative to the conveyor and to the working tool of a common structure carrying said stops, the distances between the stops being uniform, and placing said selected stop in the path of the workpiece to arrest its further progress on the conveyor. Pneumatic cushioning means are interposed between the common structure and the means for adjusting the common structure. The cushioning means are employed to absorb impact by allowing limited movement to the common structure when the workpiece abuts the selected stop, and then to reverse the said movement of the common structure to reposition the stop and hence to bring the preselected location of the workpiece opposite the working tool.

3,577,830
HYDRAULIC MOTOR
Aurelio Ortelli, Bologna, Italy, assignor to Riva Calzoni S.P.A., Milan, Italy
Filed Sept. 26, 1968, Ser. No. 762,885
Claims priority, application Italy, Sept. 29, 1967, 21059A
Int. Cl. F01b *15/00*
U.S. Cl. 92—66 **4 Claims**



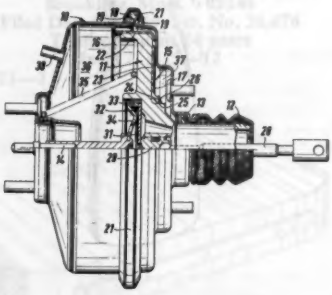
A hydraulic motor with radial propelling members, which includes a shaft provided with a cam with a spherical surface, around which a plurality of radial propelling members is arranged and in which each of said propelling members is composed of a tubular element of telescopic form attached to resilient means which initially maintain one end of said tubular element in contact with the spherical surface of the cam and maintain the other end of said tubular element in contact with a cap or a fixed striker with a spherical surface, the chamber defined by the said tubular element being in alternate communication with a source of compressed fluid and with a discharge line.

3,577,831
POSITIONING DEVICE WITH AUTOMATIC RETURN STROKE
Charles L. Brinkman, 3118 Atherton Road, Dayton, Ohio
Division of Ser. No. 515,260, Dec. 20, 1965, Pat. No. 3,302,902. Continuation-in-part of Ser. No. 608,523, Jan. 11, 1967, abandoned, continuation-in-part of application Ser. No. 228,866, Oct. 8, 1962, now Patent No. 3,228,624. This application June 27, 1969, Ser. No. 837,264
Int. Cl. F01b *15/02*; F15b *15/17*
U.S. Cl. 92—66 4 Claims



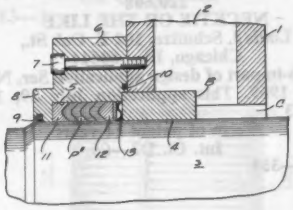
A positioning device comprises a plurality of positioning elements each having relatively movable piston and cylinder elements with restricted fluid communication between both ends of the cylinder element. Each of the relatively movable piston and cylinder elements is angularly disposed relative to other such elements which are structurally interconnected with a floating equalizer linkage to provide uniform and unrestricted movement within desired limits. Pressurized fluid is supplied to the cylinders through internal passageways to cause relative movement in one direction and the device automatically returns to its initial position when disconnected from the supply of pressurized fluid.

3,577,832
FLUID PRESSURE OPERATED SERVO DEVICES
David Parsons, Warwickshire, England, assignor to Automotive Products Company Limited, Warwickshire, England
Filed Dec. 30, 1968, Ser. No. 792,199
Claims priority, application Great Britain, Jan. 12, 1968, 1985/68
Int. Cl. F16j *3/00*
U.S. Cl. 92—98 2 Claims



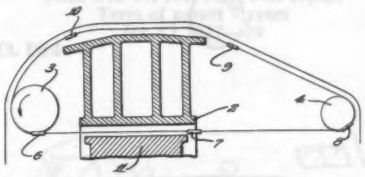
A flexible diaphragm providing a fluidtight partition between chambers in a fluid servomotor casing is held against movement of its inner edge away from a rigid member axially movable in the casing by a washer mounted on a cylindrical surface of said rigid member to form, with an annular surface on said member, a radially outwardly convergent channel enclosing a bead on that edge of the diaphragm.

3,577,833
FLUID CYLINDER
Darold M. Skelton, Brookfield, Wis., assignor to Milwaukee Cylinder Corporation, Cudahy, Wis.
Filed July 11, 1969, Ser. No. 841,018
Int. Cl. F16j *15/16*, *15/18*
U.S. Cl. 92—168 3 Claims



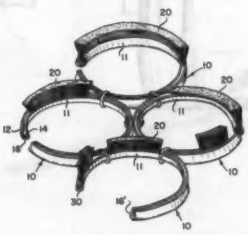
A fluid cylinder having an end cap and a retainer plate for the end cap for containing packing thereby permitting a simplified bushing to be inserted in the end cap insuring that the entire bearing surface of the bushing is lubricated.

3,577,834
GRIPPER BAR MOUNT FOR PLATEN PRESS
Pierre Lang, Vaud, Switzerland, assignor to J. Bobst & Fils S. A., Lausanne, Switzerland
Filed Dec. 9, 1968, Ser. No. 782,191
Claims priority, application Switzerland, Dec. 11, 1967, 17445/67
Int. Cl. B31b *1/20*, *17/02*; B65g *17/14*
U.S. Cl. 93—58.3 14 Claims



A device for accurately centering the gripper bars carried by a pair of endless chains, in a desired working position in a press. Gripper bars are rigidly secured at their opposite ends to the endless chains during movement of the chains and when chain movement stops, the gripper bars are released from the chains for limited freedom of movement and means then cooperate with the freed gripper bars to positively accurately center the bars.

3,577,835
SKI MAT APPARATUS
John P. Horton, Bernardsville; Robert E. Sollmann, Far Hills, and Joaquim L. Santos, Harrison, N.J., assignors to Ski-Mor Inc., Kenilworth, N.J.
Continuation of application Ser. No. 536,402, Mar. 22, 1966, now abandoned. This application Jan. 17, 1969, Ser. No. 792,909
Int. Cl. E01c *5/00*
U.S. Cl. 94—3 8 Claims



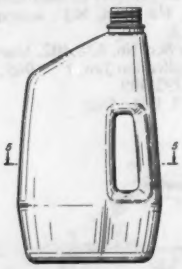
Sliding surfaces having a plurality of annular, rigid strips with bristles extending uniformly upward, the strips being interconnected to form a continuous surface of upward directed bristles in annular rings, are described herein.

DESIGNS

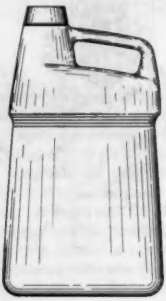
MAY 4, 1971

220,608
NECKTIE OR THE LIKE
Louis J. Schultze, 102 E. Oak St., Chicago, Ill. 60611
Continuation-in-part of design application Ser. No. 19,239, Sept. 22, 1969. This application July 29, 1970, Ser. No. 24,213
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—351

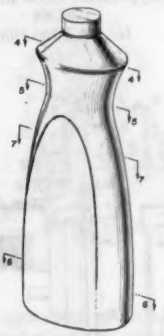
220,609
JUG OR SIMILAR ARTICLE
Michael Clement Dickins, Bletchley, England, assignor to Plysu Containers Limited, Bletchley, England
Filed Oct. 20, 1969, Ser. No. 19,624
Claims priority, application Great Britain June 23, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—43



220,610
JUG
David G. Hills, Collinsville, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 30, 1968, Ser. No. 15,137
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48



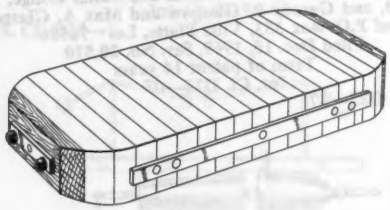
220,611
BOTTLE
David G. Hills, Collinsville, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Oct. 28, 1968, Ser. No. 14,188
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117



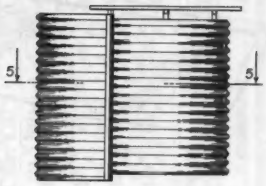
220,612
BEER CAN
Kenneth E. Siegler, 1004 S. Pine St., Port Angeles, Wash. 98362
Filed Apr. 20, 1970, Ser. No. 22,519
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—216

220,613
AEROSOL ACTUATING BUTTON PROTECTOR
Theodore Andrew Beck, Andover, Mass., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Feb. 19, 1970, Ser. No. 21,518
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—258

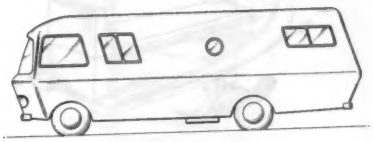
220,614
CUTTING BLOCK
Leonard K. Reichert, 16 Euston St., Brookline, Mass. 02146
Filed Dec. 12, 1969, Ser. No. 20,476
Term of patent 14 years
Int. Cl. D15—*12*
U.S. Cl. D11—1



220,615
PORTABLE OUTHOUSE
William L. Thompson, Pueblo Mountain Park, Beulah, Colo. 81023
Filed Mar. 3, 1970, Ser. No. 21,709
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1

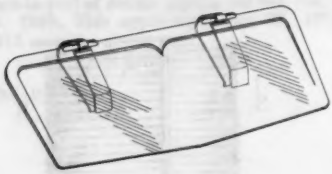


220,616
MOTOR HOME
Gerald D. Schwartz, Van Nuys, Calif., assignor to United Bus Sales, Inc., Bell Gardens, Calif.
Filed Oct. 17, 1969, Ser. No. 19,603
Term of patent 7 years
Int. Cl. D12—*09*
U.S. Cl. D14—3

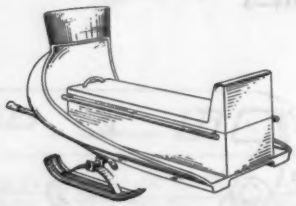


220,617
REMOVABLE LIFT FORK FOR LOADER AND BACK HOE BUCKETS AND THE LIKE
John R. Pavese, 771 Rivervale Road, River Vale, N.J. 07675
Filed Dec. 22, 1969, Ser. No. 20,756
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—3

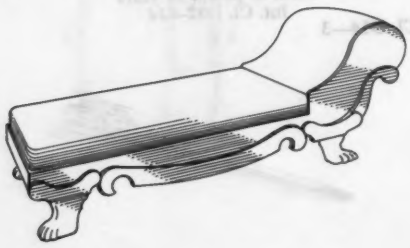
220,618
AUTOMOBILE SUN VISOR
Daniel A. Berkoff, Sherman Oaks, Calif., assignor to Hollywood Accessories, a division of Orion Industries, Inc.
Filed May 11, 1970, Ser. No. 22,932
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—6



220,619
SNOWMOBILE TRAILER
Ernest W. Rowley, 131 Wendell Ave., Weston, Ontario, Canada
Filed Mar. 23, 1970, Ser. No. 22,337
Claims priority, application Canada Sept. 24, 1969
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24

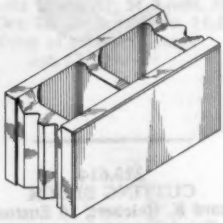


220,620
LOUNGE
Eugene F. Jones, 941 Reed Ave., East Point, Ga. 30344
Filed Dec. 17, 1969, Ser. No. 20,528
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11

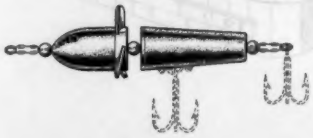


220,621
MEASURED-VOLUME DISPENSER FOR CHEMICAL REAGENTS OR THE LIKE
John J. Moran and Robert C. Querry, Houston, Tex., assignors to Hycel, Inc., Houston, Tex.
Filed Jan. 5, 1970, Ser. No. 20,759
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1

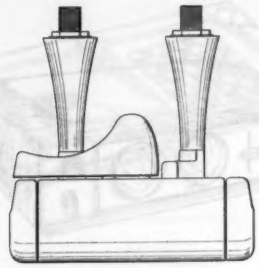
220,622
MODULAR BUILDING BLOCK UNIT
Robert J. Passander, Indianapolis, Ind., assignor to Intercom Research, Inc., Indianapolis, Ind.
Filed Dec. 15, 1969, Ser. No. 20,650
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2



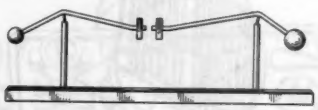
220,623
FISH LURE
Fred L. Churchman, 2820 Alaska St., Baton Rouge, La. 70803, and Garney B. Glasgow and Max A. Glasgow, both of P.O. Box 353, Ville Platte, La. 70586
Filed Dec. 15, 1969, Ser. No. 20,510
Term of patent 14 years
Int. Cl. D22—*07*
U.S. Cl. D22—27



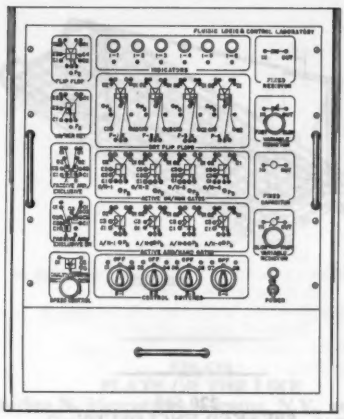
220,624
BATH FAUCET
Claude Urban, Buvingen 27, Pepingen, Belgium
Filed July 16, 1969, Ser. No. 18,217
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23



220,625
MAGNETIC TOY
Leonard Macpherson, Los Altos, Calif., assignor to Rathcon, Inc., Dallas, Tex.
Filed Dec. 11, 1969, Ser. No. 20,463
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1

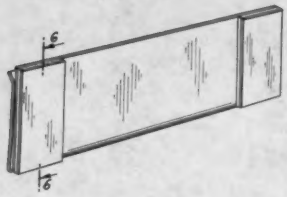


220,626
FLUIDIC LOGIC TRAINER COMPUTER
Vincent Randazzo, Brooklyn, N.Y. (680A Front St., Hempstead, N.Y. 11550)
Filed Aug. 22, 1969, Ser. No. 18,808
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



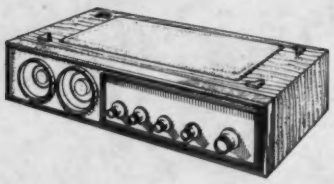
220,627
DATA TERMINAL CONSOLE
Elmer J. Stoltz, Castro Valley, and William J. Wohltmann, Jr., Mountain View, Calif., assignors to The Singer Company, New York, N.Y.
Filed Dec. 1, 1969, Ser. No. 20,318
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

220,628
HOLDER FOR ATTACHMENT TO A TELEPHONE OR THE LIKE
Robert T. Crew, 3871 Gadsden Road, Jacksonville, Fla. 32207
Filed Sept. 2, 1969, Ser. No. 18,945
Term of patent 14 years
Int. Cl. D14—*99;* D20—*02*
U.S. Cl. D26—14

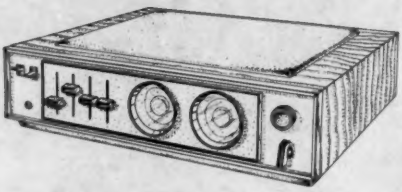


220,629
SPEAKER ENCLOSURE
Yuji Shimizu, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 9, 1970, Ser. No. 20,857
Claims priority, application Japan July 11, 1969
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

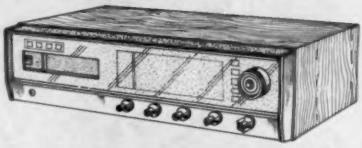
220,630
COMBINED AMPLIFIER HOUSING AND BASE FOR A RECORD PLAYER OR SIMILAR ARTICLE
Yuji Shimizu, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 9, 1970, Ser. No. 20,858
Claims priority, application Japan July 11, 1969
Term of patent 14 years
Int. Cl. D14—*04*
U.S. Cl. D26—14



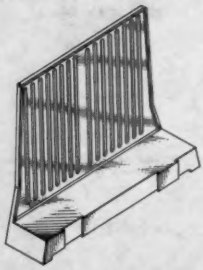
220,631
COMBINED AMPLIFIER HOUSING AND BASE FOR A RECORD PLAYER OR SIMILAR ARTICLE
Yoshiaki Iida, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 12, 1970, Ser. No. 21,422
Claims priority, application Japan Oct. 20, 1969
Term of patent 14 years
Int. Cl. D14—*04*
U.S. Cl. D26—14



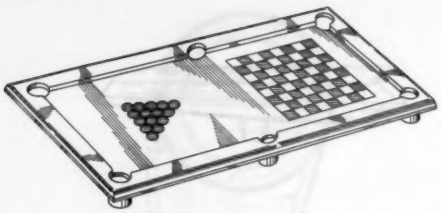
220,632
COMBINED AMPLIFIER AND TAPE RECORDER
Ippei Kurihara, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 4, 1970, Ser. No. 23,310
Claims priority, application Japan Dec. 10, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



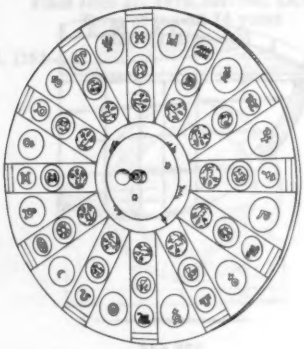
220,633
INTERLOCKABLE FILE RACK UNIT
Herbert Rome, Los Angeles, and Erland G. Paulson, Huntington Beach, Calif., assignors to Eldon Industries, Inc., Hawthorne, Calif.
Filed Dec. 12, 1969, Ser. No. 20,480
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—3



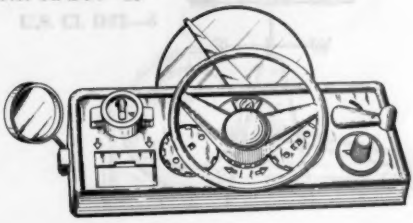
220,634
GAME BOARD OR THE LIKE
Basilio Fontana, 3339 E. 112th St., Cleveland, Ohio 44104
Filed Sept. 24, 1969, Ser. No. 19,291
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



220,635
ASTROLOGY GAME BOARD
Richard G. Boyer and Lola Elizabeth Boyer, both of 7045 Hawthorn Ave., Hollywood, Calif. 90028
Filed Oct. 24, 1969, Ser. No. 19,698
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



220,636
COMBINED AUTOMOBILE DASHBOARD AND STEERING WHEEL TOY
Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner Bros., Inc., East Paterson, N.J.
Filed Feb. 12, 1970, Ser. No. 21,407
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

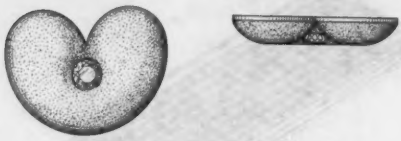


220,637
DRAINER TRAY OR THE LIKE
James B. Swett, Barrington, R.I., and Sidney Z. Smith, Worcester, Mass., assignors to Dart Industries, Inc., Los Angeles, Calif.
Filed Jan. 28, 1970, Ser. No. 21,116
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—1

220,638
PLATE OR THE LIKE
Ottorino N. Mercadante, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 1, 1970, Ser. No. 22,756
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

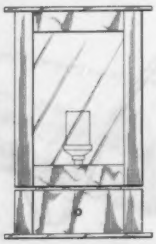
220,639
LADLE OR SIMILAR ARTICLE
Burt K. Todd, Ligonier, Pa., assignor to Kerr-Hays Co., Pittsburgh, Pa.
Filed Feb. 18, 1970, Ser. No. 21,481
Term of patent 7 years
Int. Cl. D7—*03*
U.S. Cl. D44—29

220,640
FINDING FOR COSTUME JEWELRY OR THE LIKE
Rolf E. Darbo, P.O. Box 2158,
Madison, Wis. 53701
Filed Dec. 19, 1969, Ser. No. 19,783
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1



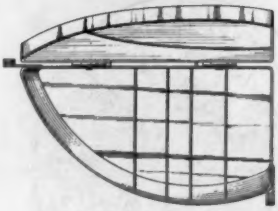
220,641
LIGHTING FIXTURE
Marilyn Lewis, Beverly Hills, Calif., assignor to
Hamburger Hamlets, Inc.
Filed Dec. 15, 1969, Ser. No. 20,496
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—4

220,642
COMBINED LAMP AND PICTURE HOLDER
Kenneth Roger Morehead, 205 Adams Ave.,
Cuyahoga Falls, Ohio 43221
Filed Jan. 3, 1969, Ser. No. 15,205
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

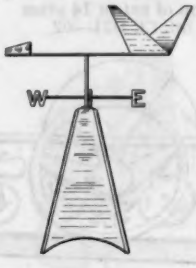


220,643
VEHICLE SIGNAL LIGHT
Joseph Nagy, 1513 Sherwood Court,
Dearborn, Mich. 48124
Filed Mar. 2, 1970, Ser. No. 21,701
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D48—32

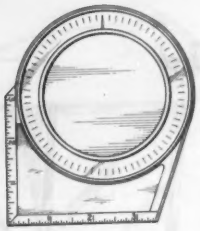
220,644
MONEY BOX
Leva Delores Robinson, 2320 E. Harvard Ave.,
Fresno, Calif. 93705
Filed Nov. 19, 1969, Ser. No. 20,171
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4



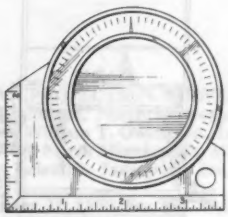
220,645
WEATHER VANE
Stephen Kwolek, 8385 Woodcrest Drive,
Westland, Mich. 48185
Filed June 18, 1970, Ser. No. 23,561
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D52—6



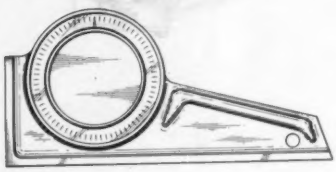
220,646
INCLINOMETER
Richard M. Provi, 1907 Brownfield Road 61107, and Donald L. Payne, 4849 Danforth Drive 61111, both of Rockford, Ill.
Filed June 22, 1970, Ser. No. 23,582
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6



220,647
INCLINOMETER
Richard M. Provi, 1907 Brownfield Road 61107, and Donald L. Payne, 4849 Danforth Drive 61111, both of Rockford, Ill.
Filed June 22, 1970, Ser. No. 23,583
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6

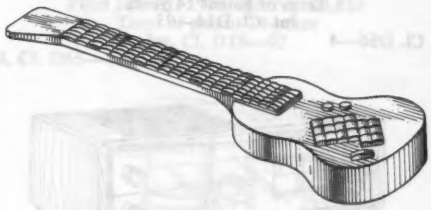


220,648
INCLINOMETER
Richard M. Provi, 1907 Brownfield Road 61107, and Donald L. Payne, 4849 Danforth Drive 61111, both of Rockford, Ill.
Filed June 22, 1970, Ser. No. 23,584
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6

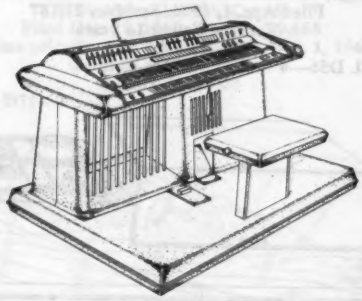


220,649
THERMOSTAT
Yoshikazu Kuze, 31–3, 1-chome, Magome Higashi, Ota-ku, Tokyo, Japan
Filed Dec. 2, 1969, Ser. No. 20,333
Claims priority, application Japan June 5, 1969
Term of patent 14 years
Int. Cl. D10—*99*; D15—*01*
U.S. Cl. D52—7

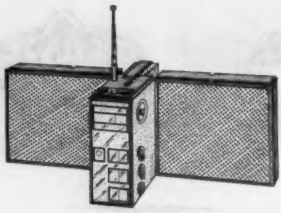
220,650
KEYBOARD-OPERATED ELECTRONIC MUSICAL INSTRUMENT
Robert N. Poznanovich, 9526 S. Manistee, Chicago, Ill. 60617
Filed Aug. 4, 1969, Ser. No. 18,536
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



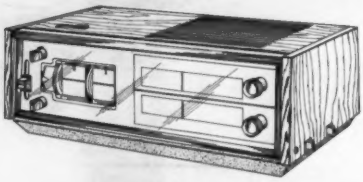
220,651
ELECTRONIC ORGAN CABINET OR SIMILAR ARTICLE
Hiroshi Saito, Osaka, and Masakazu Tatsumi, Hirakata, and Yoshiji Kon'i, Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 6, 1970, Ser. No. 22,862
Claims priority, application Japan Nov. 20, 1969
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2



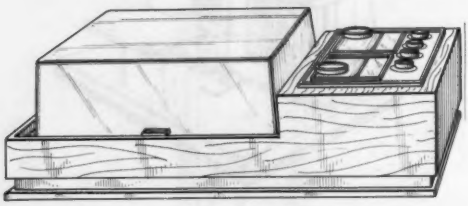
220,652
PORTABLE RADIO CABINET
Kazuhiro Hirayama and Hikaru Nakada, Tokyo, Japan, assignors to Hitachi, Ltd., Manufacturers, Tokyo, Japan
Filed Nov. 13, 1969, Ser. No. 20,071
Claims priority, application Japan May 23, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



220,653
COMBINED RADIO RECEIVER AND CLOCK
Setsuo Miyanaga, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 22, 1970, Ser. No. 23,611
Claims priority, application Japan Jan. 23, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

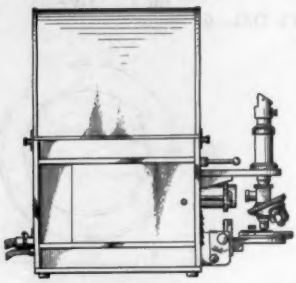


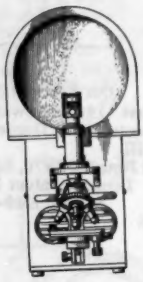
220,654
COMBINED RADIO AND RECORD CHANGER
Melvin H. Boldt, Glenview, and Kendrick T. Parsell, Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Apr. 1, 1970, Ser. No. 22,187
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



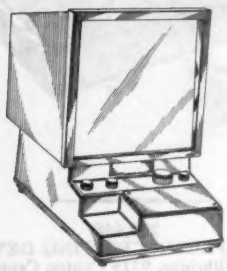
220,655
BRIDGE EXTENSION FOR EYEGLASSES
Toni Holloway, 73—465 Feather Trail, Palm Desert, Calif. 92260
Filed Oct. 2, 1969, Ser. No. 19,384
Term of patent 7 years
Int. Cl. D16—*08*
U.S. Cl. D57—1

220,656
METALLURGICAL OPAQUE PROJECTOR
Paul Rosenthal, 83–09 Talbot St., Kew Gardens, N.Y. 11415
Filed Oct. 13, 1969, Ser. No. 19,530
Term of patent 14 years
Int. Cl. D16—*03, 04*
U.S. Cl. D61—1





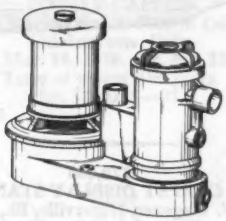
220,657
REAR PROJECTION VIEWER
William K. Christoffersen, North Minneapolis, James L. Keely, Wayzata, and William T. Owens, Jr., Long Lake, Minn., assignors to Washington Scientific Industries, Inc., Long Lake, Minn.
Filed May 21, 1970, Ser. No. 23,075
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1



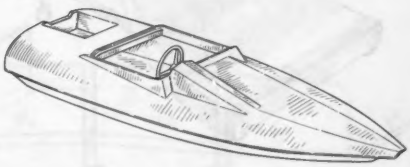
220,658
REAR PROJECTION VIEWER
William K. Christoffersen, North Minneapolis, James L. Keely, Wayzata, William T. Owens, Jr., Long Lake, and Larry D. Quanrud, North Minneapolis, Minn., assignors to Washington Scientific Industries, Inc., Long Lake, Minn.
Filed May 21, 1970, Ser. No. 23,091
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1

220,659
CALCULATING MACHINE
Mititaka Yamamoto, Kyoto-fu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto-fu, Japan
Filed Mar. 27, 1969, Ser. No. 16,478
Claims priority, application Japan Sept. 29, 1968
Term of patent 7 years
Int. Cl. D18—*02*
U.S. Cl. D64—11

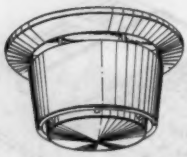
220,660
PUMP AND FILTER UNIT
Wilbur C. Smith, Plainfield, and Philip J. Nagengast, North Caldwell, N.J., assignors to Worthington Corporation, Harrison, N.J.
Filed Jan. 21, 1970, Ser. No. 21,018
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1



220,661
BOAT
Ronald Howard Line, 15 Altamont Road, Willowdale, Ontario, Canada
Filed Dec. 29, 1969, Ser. No. 20,663
Claims priority, application Canada Dec. 1, 1969
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



220,662
AUTOMATIC FIRE ALARM OR SIMILAR ARTICLE
Werner Buhrer, Uetikon am See, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland
Filed Nov. 12, 1969, Ser. No. 20,045
Claims priority, application Switzerland May 12, 1969
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D72—1

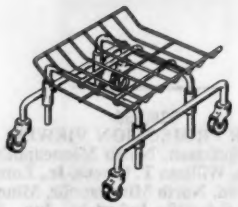


220,663
FOUNTAIN PEN NIB
Homer T. Green, Milton, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed Apr. 22, 1970, Ser. No. 22,559
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—17

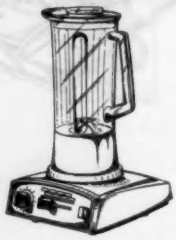
220,664
CARPET DISPLAY STAND
Ralph W. Wagoner, Naperville, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Feb. 2, 1970, Ser. No. 21,191
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

220,665
HEATER HOUSING FOR HAIR CURLERS
John L. Benty, Scotch Plains, N.J., and Svend Fischlein, Albertslund, Denmark, assignors to Bristol-Myers Company, New York, N.Y.
Filed Mar. 9, 1970, Ser. No. 21,794
Claims priority, application Denmark Oct. 7, 1969
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

220,666
THERAPEUTIC CREEPING DEVICE
Reba M. Lillibridge, 9319 Canton Center Road, Plymouth, Mich. 48170
Filed Dec. 24, 1969, Ser. No. 20,632
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D88—5



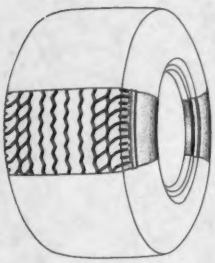
220,667
BLENDER OR SIMILAR ARTICLE
Yasuhiro Koshido and Hideo Kondou, Tokyo, and Koichiro Ninomiya and Itusei Sato, Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed June 5, 1970, Ser. No. 23,330
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D89—1



220,668
SIDEWALK BICYCLE
Frederick E. Purdy, Olney, Ill., assignor to AMF Incorporated
Filed May 1, 1970, Ser. No. 22,750
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—8

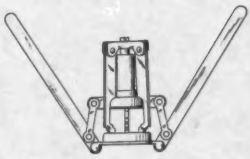
220,669
BICYCLE SEAT, OR SIMILAR ARTICLE
Charles V. Wrobel, Lake Forest, Walter Dian, Downers Grove, and Gerald Golden, Highland Park, Ill., assignors to Excel Incorporated, Franklin Park, Ill.
Filed Sept. 18, 1969, Ser. No. 19,199
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—16

220,670
TIRE
Iain C. Mills, Sutton Coldfield, England, assignor to The Dunlop Company Limited, Birmingham, England
Filed Feb. 20, 1970, Ser. No. 21,543
Claims priority, application Great Britain Aug. 28, 1969
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20

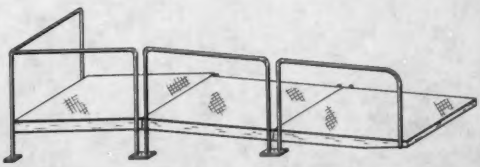


220,671
TOWEL OR SIMILAR ARTICLE
Edward C. Taiman, Tarrytown, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,394
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26

220,672
BOTTLE CAPPER
Iganzio Ronchetti, Via Fratelli Calvi 67, Calolziocorte, Italy
Filed Mar. 18, 1970, Ser. No. 21,951
Term of patent 3½ years
Int. Cl. D15—*05*
U.S. Cl. D94—3



220,673
COMBINED PLATFORM AND RAMP
Harry W. Holbrook, 9 Donegal Way, Pinole, Calif. 94564
Filed Dec. 22, 1969, Ser. No. 20,592
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—7



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PATENTS WERE ISSUED ON THE 4TH DAY OF MAY, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Alexander, Arthur P.; Aronson, Steven R.; and Langenhagen, Charles F., Jr., to Packaged Resins Company, Inc. Shoe last remodeling jig. 3,577,578, Cl. 12-146.

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Anhorn, Victor J.: *See—*
Pace, Henry A.; and Anhorn, Victor J.,3,577,398.
Aoki, Ichiro; Iwasaki, Kenji; Yoshihashi, Tamaji; Koinuma, Tokuju; Kato, Masao; and Fukatu, Akihiro, to Tokyo Shibaura Electric Co., Ltd. Magnetron device with cooling fluid flow in longitudinal direction of magnetron tube. 3,577,033, Cl. 315-39.71
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Lee, Robert L., 3,577,639.
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Ardary, Zane L.; Maxey, Andrew W.; and Reynolds, Carl D., to United States of America, Atomic Energy Commission. Fibrous thermal insulation and method of making same. 3,577,344, Cl. 252-62.
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Murakami, Masuo; Kuriaki, Kaname; Iwanami, Masaru; Arima, Hideki; Sano, Kenji; Suzuki, Hiroshi; and Kagami, Soichi,3,577,551.
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LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Atadan, Erdem M., to E. I. du Pont de Nemours and Company. Purification of dipotassium terephthalate. T886,004, 5–4–71, Cl. 260—525.

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Gabriel, Martin G., to Ford Motor Company. Hydrokinetic power transmission system with a substantially ideal functional relationship between output speed and tractive effort. T886,001, 5–4–71, Cl. 74—732.

Harris, Roland G.: *See*—
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Harvey, John V., B. A. Robinson, and J. W. Stassen. Apparatus for detecting oversize defects in yarn. T886,007, 5–4–71, Cl. 73—160.

Hoiness, David E., to E. I. du Pont de Nemours and Company. Transmission cables. T886,009, 5–4–71, Cl. 174—25.

McConkey, James E. Drawing board. T886,008, 5–4–71, Cl. 312—23.

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Wolinski, Leon E., to E. I. du Pont de Nemours and Company. Gauge control of foam structures. T886,003, 5–4–71, Cl. 264—51.

Wolinski, Leon E., to E. I. du Pont de Nemours and Company. Printing inks. T886,005, 5–4–71, Cl. 106—27.

Wolinski, Leon E., and R. G. Harris, to E. I. du Pont de Nemours and Company. Preparation of oriented foam laminar structures. T886,002, 5–4–71, Cl. 156—311.

LIST OF DESIGN PATENTEES

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CLASSIFICATION OF PATENTS

ISSUED MAY 4, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

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